

DIGITAL

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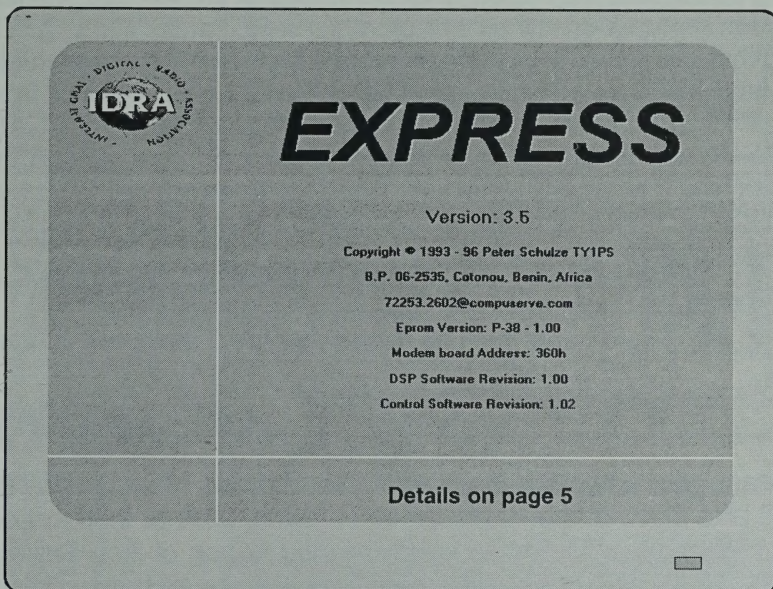
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At long last, the proven HAL DSP Modem architecture, modes, and software are available for applications that cannot use plug-in PC cards. While the DSP4100 closely follows the concepts of the PCI-4000, now you get CLOVER-II and high-performance TOR, Pactor, and RTTY in a stand-alone DSP modem. Requiring only 0.25A from a 12V battery, the 2.75 lb DSP4100 will go anywhere you can take your LAP-TOP PC and transceiver. Software changes are easily made in the field. Just pick-up new software from HAL and upload it to the DSP4100 via the serial port for storage in non-volatile *FLASH* RAM. A 2nd RS-232 port is included for customized systems. Call HAL now for complete details.



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* * * NOTICE OF MEETING * * *

Please take notice that the meeting of members of the International Digital Radio Association will take place at the Radisson Inn, Dayton, Ohio at 9:00 am on the 17th day of May, 1996. The purpose of the meeting will be the election of Ron Stailey, AB5KD and Glenn Vinson, W6OTC as directors and such other business which may come before the meeting.

Allan E. Matlick, Secretary/Treasurer

PROXY STATEMENT

INTERNATIONAL DIGITAL RADIO ASSOCIATION

I, the undersigned _____ hereby
(signature)

appoints **Allan E. Matlick** as proxy for the purpose of voting in my place and stead at the annual meeting of members of the International Digital Radio Association for all matters which may come before the meeting to be held on the 17th day of May, 1996 at the Radisson Inn, Dayton, Ohio.

Name _____
(Please Print)

Dated: _____

Callsign _____

Please fill out and mail to the
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or e-mail your response directly to:
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The principal goal of the IDRA is to advance digital technology as it applies to amateur radio and promote the wisest use of the digital portion of the spectrum. Being a member makes you a partner in advancing these digital goals. IDRA is a not-for-profit corporation and contributions to the Society are deductible for income tax purposes to the extent allowable under the tax laws of the United States.

Have you checked your mailing label lately?

If the **Expiration 04/96** appears next to your name, it means your **IDRA** membership, and subscription to the **Digital Journal**, expires with this issue.

To keep your membership, and all the latest digital news coming your way, just fill out the coupon on page 29 and mail it -- **Today!**

The most powerful DSP-Modem is now available:

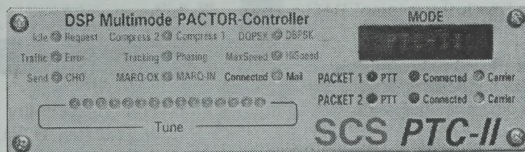
SCS PTC-II

The Multimode-Multiport-Controller with PACTOR-II, the fastest digital mode on HF!

The PTC-II-Hardware:

- Three simultaneously available communications ports: HF and up to two VHF/UHF Packet ports.
- Separate transceiver control port for remote operation of Icom, Kenwood and Yaesu equipment.
- True 32-bit system with the Motorola RISC processor 68360 as CPU, clocked at 25 MHz.
- 16-bit Motorola DSP 56156 clocked at up to 60 MHz (computing power: 30 MIPS).
- Expandable to 2 MB of static and 32 MB of dynamic RAM, firmware stored in flash memory.
- Modem tones programmable in 1 Hz steps.
- All digital modes can be implemented.
- All advantages of the PTCplus are also included.

For more details on the PTC-II and PACTOR-II see the January to April '95 issues of the Digital Journal!
Basic PTC-II with 512k static RAM: 950 US\$, Airmailing: 35 US\$ - VISA and MASTER cards are accepted!



The PACTOR-II-Mode:

- In good conditions up to 30 times faster than AMTOR, up to 6 times faster than PACTOR-I.
- Most robust digital mode: Maintains links in conditions with a signal to noise ratio down to minus 18 dB.
- Best bandwidth efficiency: Even using the fastest mode, PACTOR-II requires less than 500 Hz (at minus 50 dB).
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- Fully backwards compatible with all known PACTOR-I implementations, including automatic switching.
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President's Corner

A view from the top

by Paul S. Richter, W4ZB

P.O. Box 19190 • Washington, DC 20036-9190 / CIS 70743,3517



It's hard to believe time is flying so quickly. The Dayton Hamvention is almost upon us again, with its new time in mid-May. This year it falls on Friday, May 17 through Sunday May 19th.

I want to remind everyone of this, particularly those that haven't yet made plans to attend, or who haven't yet decided whether or not to attend. Don't miss out on this! If you will be able to make it, contact Dale sinner W6IWO about getting reservations to stay at the Radisson.

We urge everyone to attend the short IDRA member's meeting on Friday morning at the Radisson. Those of you who cannot attend should return the proxy statement which can be found inside the front cover of this issue of the Digital Journal.

The member's meeting on Friday morning will be followed immediately by the IDRA Forums—a full morning of pre-

sentations and discussions about current digital mode topics. Plan to attend that now and look for the full agenda in the May issue of the Journal.

The Contesters/Dxers dinner is being run by Ron AB5KD again this year. This big show takes place on Friday night at the Radisson, of course. Get your tickets from Ron right away—this one completely filled up last year.

And don't forget the main dinner on Saturday night—the Digital Journal Dinner! This is the big one which everyone attends. The main speaker this year will be Glenn Vinson W6OTC. Get your tickets now from Wayne Matlock WA6VZI to save the last minute hassles.

I look forward to see you at Dayton in May!

73, Paul W4ZB

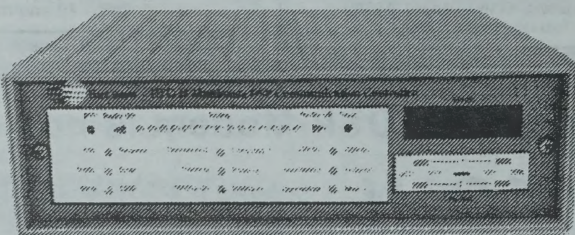
The PacComm PTC-II

The PTC-II is a new multimode controller and "communications platform" which contains powerful and flexible hardware and firmware.

Built in the United States by PacComm under license from S.C.S., the group that developed both the original PACTOR and PACTOR-II.

The PTC-II offers the most robust HF digital protocol available to radio amateurs, but it should not be overlooked that the PTC-II is configurable as a triple-port multimode controller supporting packet data rates of 1200 and 9600 bps and numerous other modes.

- A step-synchronous ARQ protocol.
- Full support of memory ARQ.
- 10 character MODE display, multi-colored LED tuning and status displays.
- Watchdog timer on HF PTT port.
- Specialized communication program provided.
- Firmware contained in Flash memory. Easy upgrade.
- Long-path capability for worldwide connectivity.



- Full compatibility with PACTOR-I (the original PACTOR), AMTOR, and RTTY.
- Automatic switching between Level-1 (PACTOR-I) and Level-2 (PACTOR-II) at contact initiation.
- All-mode mailbox with up to 32 megabytes of storage.
- Occupies a bandwidth of under 500 Hz - use your 500 Hz CW filters.
- DBPSK modulation yields 200 bps (uncompressed).
- DQPSK modulation yields 400 bps (uncompressed).
- 8-DPSK modulation yields 600 bps (uncompressed).
- 16-DPSK modulation yields 800 bps (uncompressed).

- Independent of sideband; no mark/space convention. Center frequency adjustable between 400 and 2600 Hz to exactly match your radio's filters.
- Differential Phase Shift Keying with two continuously transmitted carriers. 100 symbols per second. Constant bandwidth irrespective of actual transmission speed.
- Powerful Forward Error Correction (FEC): High performance convolutional coding. Constraint length of 9. Viterbi decoding using soft decision point. Coding rate varies between 1/2 and 7/8.
- Intelligent data compression monitors compression ratio and self-bypasses if not being effective. Huffman compression for English or German text. Markov (2 level Huffman) compression. Run-Length encoding for repeated sequences.
- Limited availability. Packet modems available later. \$995. Packet modems are optional at extra cost.

DSP firmware now supports audio filtering.

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Across the Pond

A look at the *digital-doings* of our European neighbors

by Neal Campbell, AB4MJ/ON9CNC • 10817 Ann Davis Dr. • Fredericksburg, VA 22401

Internet: neal.campbell@ping.be



Every major release of Express turns out to be an important event for the digital community that uses Clover-capable products. Express is one of the premiere products for Clover communications, and boasts one of the best user interfaces in the digital communications world of amateur radio. It is always with great anticipation when a new release of Express is received.

I received the latest version of Express, version 3.5, just as the deadline approached for the March issue of Digital Journal. While I was tempted to give a sneak preview of the product in that article, I decided to wait until the April issue to give a formal review.

General Introduction to Express

If you have never used Express prior to now, nor read my last two articles, this is a general introduction to the features and highlights of this fine program.

If you have worked any digital mode (excluding CW) on HF, you have utilized some type of terminal program. I started with a Kantronics KAM and a general terminal program in the late 80's. I wrote a hundred little macros that would take the KAM from AMTOR to RTTY, send CQ, etc.. When I bought Kantronic's terminal program, Hostmaster 2 Plus, I was in heaven! Here was a really nice program that hid the complexity of the KAM from me. It was tailored to the device, did everything that I had ever thought of doing, and was very simple to use.

My experience with Hostmaster gave me some idea of how powerful and helpful a good program could be. When I switched to using the HAL Communications PCI3000 card for RTTY, I used the PCA program that HAL supplied. It was not as friendly as Hostmaster, but I learned to live with it. When I bought my P38 card, it came with the P38 program, which is very similar to PCC, which comes with the PCI4000 card. These programs are functional and simple, but hardly very eloquent.

Enter Express.....

Express is a Windows-based data communications program that is tailored to run with HAL Communications' products utilizing Clover. These products are: PCI4000/M, P38 and DSP4100. All three HAL products not only handle Clover modulation, but offer impressive performance on Pactor, RTTY and Amtor. None of the products can transmit HF packet, as HAL (as well as many others, including myself) believe that packet is not suited to the propagation characteristics of HF.

As a dedicated terminal program for these devices, you should expect a high degree of integration and automation. You can relax, as Express provides every automated assistance that I can imagine.

Here is a general feature list:

- Full implementation of Windows GUI
- Manages all modes: Clover, Pactor, Amtor and RTTY
- Macro capability, with usage of variables (like "His call" and "Switch to RX")
- Personal Mailbox
- Built-in tuning indicators
- Sketch module, allowing you to create and send color sketches in real time

- Picture editor, allowing you to acquire, edit, compress and send pictures
- Voice recording, compression and transfer
- File transfer
- Rig control
- Log function
- Transmit/receive text capture
- Feature control of the HAL products.

Version 3.5 started out as a correction release for version 3.0.2. As often happens in bug-fix releases, some new features were added. As Peter, TY1PS, said, "It is more than a simple bug-fix of 3.0.2 but not yet a full 4, thus the 'half way' number, 3.5."

What major new features are included in Express 3.5?

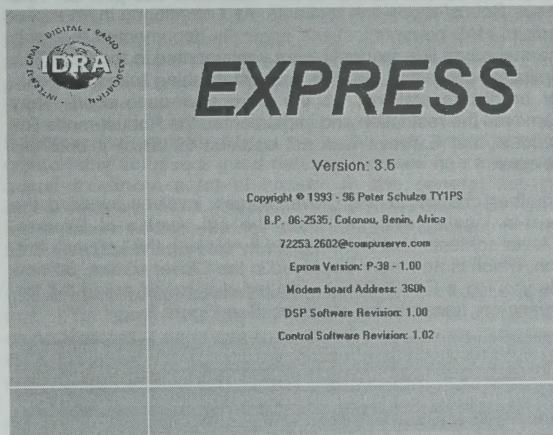
- Greatly improved tuning indicator for RTTY, Amtor and Pactor
- Customizable user interface
- Sophisticated picture editor
- Support for the DSP4100.

Installation

I received the update installation file from the IDRA FTP server, once TY1PS sent a note on the Internet that it was available. If you need help in receiving your upgrade, I will give you instructions at the end of this article.

I always protect myself when installing new software by completely copying the existing directory in order to provide a fall-back path in case trouble arise. You can do this with the File Manager under Windows or with XCOPY under DOS.

The installation process of Express 3.5 was quick, painless and effective. See Figure 1.



Once installed, I started the program and witnessed the first change: it asked me to specify what device I was using, either PCI4000, P38 or HAL's new DSP 4100. This start-up interrogation is needed because the DSP4100 is an external device that communicates with Express through a communications port, instead of internal port addresses like the PCI4000 and the P38.

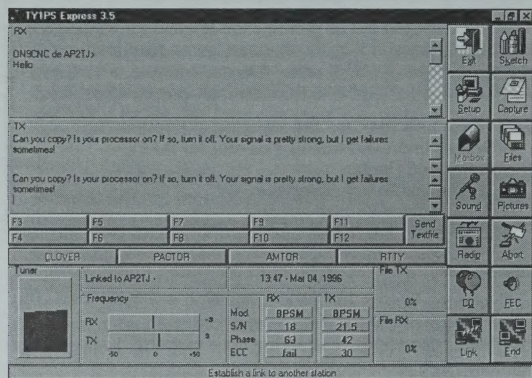
Unfortunately, I do not have a DSP4100 (maybe one day...) so I could not test Express with the external communications port, but I am sure it works just as the other cards. Peter, TY1PS, reviewed the DSP4100 in the February Digital Journal, if you are interested in more information about the newest Clover device.

After specifying the device you are using, and the directory for the firmware files, Express 3.5 initializes just as prior releases.

There is no un-install program, but, at my shack, one is not needed!

Clover

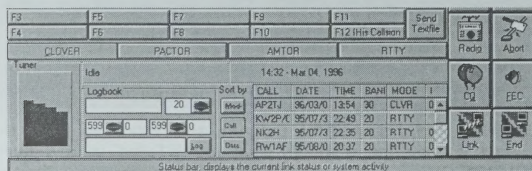
Once you have installed the upgrade and initialized the program, things do not look so revolutionary. In fact, the Clover screen looks about like it did before, so what is the big deal? See Figure 2.



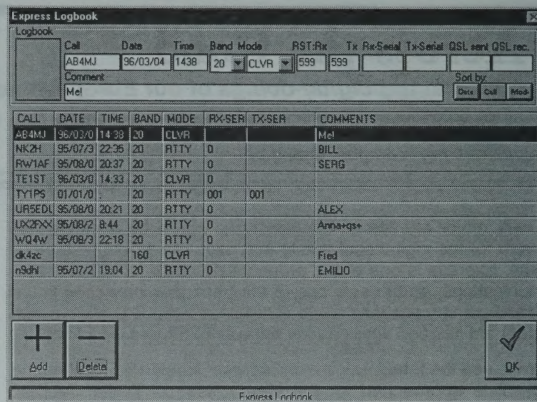
One immediate change in the screen layout is that the big F2 function key, with your registered call-sign is no longer there. This is because F2 no longer gives an ID. If you press F2 now, it will give a CW ID. In other modes, F2 provides the over command or reverses the tones.

A nice update to Express for P38 users is that you can now issue Robust-mode link requests. As I mentioned in an earlier article, HAL communications originally documented that only normal-mode link requests were implemented in the P38. This limitation prevented the P38 from establishing links with weaker or distant stations, as the chirp was quite short. They removed the restriction and implemented the Robust-mode link request, but Express was not updated to utilize it until this release.

Another change in the Clover screen involves invoking the built-in logging system. Under the old version of Express, Clover contacts had to be logged by clicking the Logbook button, which is no longer displayed in the Clover screen. So how do you log a QSO? Simple, double-click anywhere in the frequency or transmission statistics. See Figure 3.



Enter the relevant information, press the Log button. Once the contact is logged, you can edit or view the log by double-clicking any entry. Once you do this, the screen seen in Figure 4 allows you to browse and edit the log:

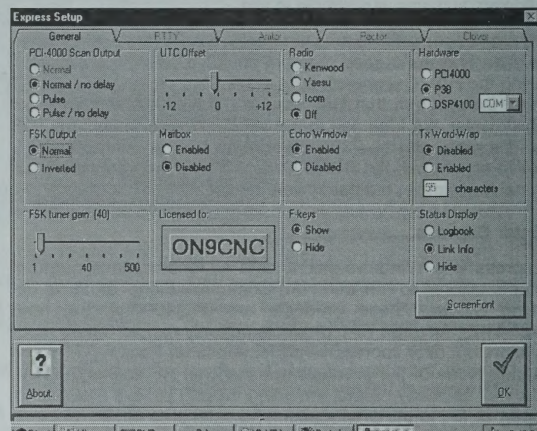


As you use the arrow key to scroll down the log, any contacts for which you have link pictures will have the picture automatically displayed in the square in the top left of the screen. To leave the logbook, click on OK button, and you are back to the Clover screen. Double-click on the link-status or date/time sections of the form, and the usual transmission data is displayed.

The logbook is visible in all other modes by default. It also is accessible with the Logbook button in screens for the non-Clover modes.

General Screen Appearance

Click on the Set-up button. You can see that nothing has changed on the Clover section of the set-up, but click on the General section. See Figure 5.



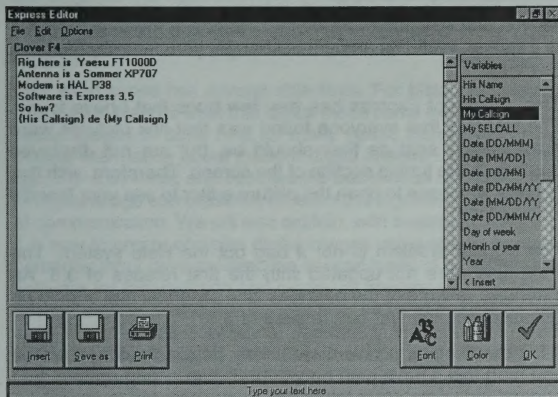
There are a lot of changes on this screen that highlight the difference between Express 3.5 and prior versions. In the upper right of the screen, you can see where the addition of the DSP4100 has impacted the set-up. In this box, you can choose which device you want to use.

Towards the lower part of the screen, you can see a selection box for F-keys. This set-up parameter lets you customize the display so that the F-Key buttons are not visible (though they still function). By clicking hide, our Clover screen will now appear without them. I always press the function keys from the keyboard, so I always leave the F-keys hidden.

How do you update the text that will be sent when pressing the

function keys? For the newcomers, one way to update the text assigned to a function key was to click on the function key button with your right mouse button. You might have forgotten that your mouse has (at least) two mouse buttons, but Express takes advantage of both the left and right button.

If you decide to remove the F-key buttons from your screen, the way to edit the text is to press CTRL then the function key that you want. By typing text, or selecting from the scrollable list of variables and clicking on insert, you can still easily build or maintain your special macros. I find that the macro capability of Express is the nicest in any program. See Figure 6.



Express maintains a separate set of Function key macros for each mode (Clover, Pactor, Amtor and RTTY). As you can see above, I have used F4 as my brag tape, outlining the operating conditions.

One advantage to leaving the function keys visible on the screen is that Express shows you the first few characters so that you always remember what is assigned to each function key.

Examine the general set-up screen again. Another new box is Echo Window. If you leave it enabled, Express 3.5 looks just as previous versions. However, if you disable the echo window, the entire TX window is now available for buffered text. You will not see the text as the HAL device has transmitted it.

If, like me, you sometimes want to see the echoed text and other times you do not, Express has a short-cut. By double-clicking your left mouse button in the transmit text section of the window, it will toggle the setting.

The last setting in this box that dramatically changes the screen display is the Status Display box in the lower right corner. By setting it to logbook or link information, you can control how the Clover display normally appears. As we mentioned earlier, you can dynamically change this. However, if you set this box to Hide, neither link information nor logbook data will appear. The screen now becomes one jumbo QSO screen. Some will like that idea, some will resist giving up all the tools of the trade. Take your pick.

With Express 3.5, you now have capabilities to tailor the display to match your personal preferences! Of course, all of the options mentioned above apply to the other modes of operation, in addition to Clover

Advanced Tuning Indicator

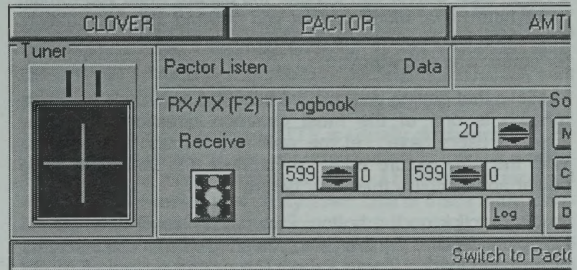
The weakest feature of previous versions of Express was the tuning indicators for all non-Clover modes. Unless I used an external tuning indicator (I keep my old KAM connected to a scope), I could not reliably tune RTTY, Amtor or Pactor stations with Express.

The biggest improvement in Express 3.5 is the new tuning system.

A few issues ago, Bill Henry of HAL ran a series of articles on building tuning indicators for RTTY. This topic has been hotly debated as there is no scope output on the Clover-capable devices from HAL. Died-in-the-wool RTTY fanatics could not imagine life without a tuning scope.

Once these woolly RTTY operators experimented with the tuning indicators in programs like Express, WF1B or PCC (or P38), many decided that they would stick to a device with a scope output.

TY1PS listened to all of these discussions and decided to implement a "scope-like" tuning indicator in Express. To date, its the best tuning indicator within a program that I have used. Take a look at the new tuning indicator in Figure 7.



As you can see, it is in the bottom left corner of the screen. The tuning indicator is actually two tuning indicators, a course and a fine indicator.

The rectangular box with the two red lines, is the course tuning indicator. You tune a station until the two red lines are as close to the center line of the rectangle as possible. Once you have the station tuned closely to the middle, you can use the "scope" indicator to exactly tune him.

The "scope" does not really imitate a tuning scope. In tuning scopes, a perfectly tuned station will result in a nice Lissajous pattern, affectionately called "crossed-bananas". With the Express indicator, you tune until the pattern is a large cross of solid lines, a perfect cross-hair. Of course, HF propagation patterns, noise, etc. will prevent you from always achieving a perfect solid cross. But if you see that pair of "crossed bananas" this is not what you want with the Express tuning indicator.

If the receiver output of your rig is too high or too low to comfortably achieve a good pattern, Express has a way to adjust it without a lot of hassle. In the general set-up screen, you will find a box called "FSK Tuner Gain". By raising or lowering this setting, it will adjust the range of the tuning indicator to a best match with your rig.

I have spent many hours playing with the new tuning system. I no longer use my KAM/Scope combination while using Express. I even can tune 20 meters without listening to the receiver audio and tune QSOs. That is the best complement I could give any tuning system.

If you liked the four-bars tuning indicator used by HAL with their software, Express can display these also. By clicking on the tuning indicator, Express will show you bars resembling the Clover tuning indicator. To use these bars, you want to tune so that the middle two bars are in equal strength. Please note that the FSK tuner gain control on the general set-up screen has no effect on this tuning indicator. I have not found this alternate tuning system very useful, but it is there if you prefer it!

More than a thousand words

Express has one of those features that the first time you see it you think "What a brilliant idea"! I am referring to the link picture. For those who have never witnessed the link picture, imagine that you are tuning the Clover frequencies and hear N2HOS calling CQ. You click the Link button and establish a link with Jim. Immediately, a small picture of Jim appears in the tuning section.

Express maintains a library of link pictures, and whenever you establish a link with anyone in the directory, their picture will automatically appear. Whenever you contact another station using Express, and you do not have the link picture of the station, Express will initiate a file transfer of the picture to you.

Link pictures are small and compressed, so they are only about 2 KB in size. Clover can transfer the picture while you remain in keyboard chat mode without you noticing any degradation. Therefore, it is important to get your picture scanned and ready for others who talk with you.

I believe that getting your picture scanned and ready for transmission is one of the most common questions that new Express users have. Let me walk you through the process. With the new picture editor in Express 3.5, you have more power and flexibility than ever before.

To begin, click on the button, Pictures. This will open up the new picture editor. By this time, you should have scanned your picture and loaded it onto a disk. The picture editor in Express can handle the following formats of pictures;

Windows bitmaps	JPEG0
ZSoft PCX	WordPerfect
GIF	Sun Raster
TARGA	CALS Raster
Adobe Photoshop 3.0	MacPaint
Windows Meta	Macintosh PICT
Encapsulated Postscript	Microsoft Paint
TIFF	GEM image
Kodak PhotoCD.	

Within the picture editor, you can brighten, sharpen, contrast or do just about any other thing that you might need to do to a picture. The one feature missing (one that I needed badly for my own picture) is a cropping utility. Cropping will allow you to select which part of a picture to keep and throw the rest away.

Once you have the picture looking just like you (or just like you wanted to look!), go to the file menu and select "Create Link Portrait". This will automatically compress your picture and store it, ready for you next QSO with an Express user!

I have found that link pictures add a great deal to digital communications. By its very nature, digital communications do not allow you to get the feel of the person to which you are typing. In the days before electronic keyers (yes I am that old), you could often tell a ham by the sound of their fist on CW. I can certainly tell the voice of many of my friends on the bands. Being digital, however, means that you have no sensory clues to who you are meeting. Link pictures bring me closer than almost anything else, except hearing their voice.

It adds a great deal of pleasure, so go to extraordinary measures to get your picture scanned. Make it personalized, indicating something special about you. My link picture includes my female English Springer Spaniel, Izobel.

The picture editor also lets you transmit a picture. Look under the File menu for the menu item "Transmit". Please be careful to compress your pictures before you transmit them. To do this, select the "Compress" menu item under the File menu. All image files that are not compressed are very large, and will take a long time to transfer.

So whats the bad news?

As you can see, there are many changes in the latest release of Express. With this amount of change, you naturally expect a few bugs.

This release of Express has very few bugs that I have found. The first bug that everyone found was that link pictures were automatically sent as they should be, but are not displayed properly in the tuning section of the screen. Therefore, with this release, you have to open the picture editor to see your friend's smiling face.

The biggest problem is not a bug but the Help system. The Help files were not updated with the first release of 3.5. An extensive re-write of the help files is in progress and should be released with the first bug release of 3.5.

All of these minor problems will likely be resolved by the time you read this. I have high hopes for the new Help system, as I understand some great talent has been recruited to assist!

Where do I go from here?

If you are already a registered user of Express and can access the Internet, connect to the IDRA FTP site. There is a link from the IDRA Web page to their FTP site. I have a bookmark to this site, as I also get my updates of the RTTY by WF1B software as well as others from there.

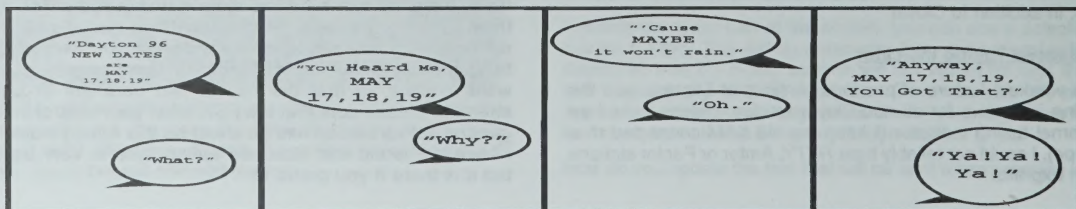
If you live in the US and do not have access to the Internet (or do not know someone who does) contact the IDRA. A 3 1/2 inch disk is available to all registered users for \$5 US and is postpaid anywhere in the world. If you live in Europe and do not have access to the Internet, I also can help you. Send me a blank floppy and a SASE, and I will happily make a copy for you.

Breaking news

As I was finishing this article, HAL Communications has just released a new version of their firmware files for the PCI4000 and P38 cards. The new firmware finally fixes problems in Pactor. These problems would wreck havoc when you were attempting Pactor QSOs under bad conditions. The new firmware files are also available on (you guessed it) the IDRA FTP site and the IDRA Disk Library!

If you see me on the bands, please contact me. If not, send me E-mail via my Internet address!

1996 DAYTON HAMVENTION



Digital Images for Digital Mode Communications

Part One

by Paul S. Richter, W4ZB

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The computer facilities routinely available now in modern digital mode ham stations offer impressive possibilities for the creation, use and exchange of complex digital images during routine communications. Yet the potential for the use of digital image exchanges which now exists is not yet widely used in ham radio practice.

This short series has several objectives. For historical perspective, we will first point out that digital mode hams have been using digital images of sorts now for many years; then provide basic tutorial information about modern digital images - what they are and how they work; and describe the basic ideas and techniques of digital image compression, an essential ingredient for this form of communication. We will also explain, with examples, how easy it is now to create complex digital images using readily available computer input devices; describe several types of digital imaging software for manipulation and display of images; and, we will, of course, explain how digital images may be used in modern ham radio digital mode operations, particularly those modes which now allow or are readily adaptable to allow binary file transfers (e.g. Clover, Pactor and Packet).

We all have heard the ancient Chinese proverb: "A picture is worth a thousand words". Visual images do indeed substitute for and reduce the need for verbal (i.e. oral or written) communications in many instances. This perhaps explains why hams (as we will see in a moment) have now been exchanging primitive digital images for more than 40 years! Spoken or printed words, used since the earliest times to describe images which could not otherwise be perceived visually, are immeasurably enriched an ability to exchange visual images concurrently with a verbal communication link.

The Historical Perspective

The earliest types of electro-mechanical teleprinters (including the telegraph code printers of the mid-1800's) printed sequences of symbols onto narrow strips of paper tape which could then be cut into sections and pasted onto sheets of paper. By the 1920's advanced teleprinters printing onto continuous rolls of paper were in common use. As successive symbols representing text were received and printed, the paper, the paper roll could be cut into sheets for easier handling and reading of the successive pages.

A principal advantage of the continuous roll type teleprinter was the elimination of the manual step of cutting and pasting paper tape segments onto pages. To achieve this, the "carriage return - line feed" signaling system was developed so that an teleprinter receiver could be automatically directed to advance its page and start a new line of printing in synchronization with the print position of the corresponding teleprinter transmitter.

Teleprinters with this improved arrangement utilized print symbols having predetermined, fixed widths on the each printed page. Because of this, a teleprinter transmitter could control and determine the particular symbol printed (or not printed) in each print position on the continuous roll page at the teleprinter receiver to which it was connected over an error-free transmission channel. When in 1953 the FCC amended its rules to permit RTTY operation on the amateur bands for the first time, amateur radio operators began acquiring and using surplus tape and continuous roll teleprinters for their RTTY operation.

Within a short time, these early RTTY operators recognized that continuous roll teleprinters could be used for the transmission of what became known as RTTY Artwork. These were crude and primitive forms of digital images consisting of sequences of symbols printed in particular arrangements which suggested particular recognizable visual images. Examples of RTTY Artwork occasionally appear in the Digital Journal, and much more often in its predecessor, the RTTY Journal. RTTY Artwork was usually prepared and laid out by hand using trial and error techniques, which included overprinting, and then recorded on punched paper tape. Then the RTTY Artwork could be later duplicated and reliably sent using punched tape equipment.

In current practice, received RTTY is usually displayed on computer screens having 20 lines or less devoted to the text display. Because it is no longer common to print out hard copy of received text, RTTY Artwork is now rarely seen. Use of these early forms of digital images faded as electro-mechanical teleprinters became obsolete. Many newcomers have never seen or received RTTY Artwork over the air! Although the almost universal use of computer equipment in modern digital mode ham stations has caused old-time RTTY Artwork to become a dying art, these same computer facilities now offer impressive possibilities for the creation, use and exchange of complex digital images.

The 5-bit Baudot signaling code convention used with RTTY does not support and is not easily adaptable for the exchange of binary files which are needed for the exchange of modern digital images. It is technically feasible to design (either in software or hardware) a customized code converter with embedded forward error correction capability to permit the transfer of binary files with RTTY. But I am not aware that any such system has ever been developed for ham radio use.

More sophisticated forms of digital artwork based upon ANSI code and DOS based computers (using limited "color" and DOS graphics characters) are now frequently seen in now using the PACTOR and Packet modes. But the capabilities of these systems are still primitive compared to what is now possible.

What Do We Mean By Modern "Digital Images"

We use this term to describe any digital image displayed on a modern computer as a single still image and which is stored in a binary computer file. The digital image can be retrieved and displayed from its binary computer file, and the computer file containing the digital image can be sent from one place to another by many means.

This definition encompasses virtually any still graphics image which the observer can visually perceive on a computer display, but emphasizes the fact that the digital image corresponds to a particular binary computer file. Our definition is not restricted to computers running any particular operating system although our focus will be on Windows and DOS computers as we discuss specific details later in this series. Those who have worked with computer graphics and digital images already know that there are many different types of graphics and image file formats (e.g. *.GIF, *.JPG, *.TIF, *.CDR, *.DWG, etc.) now in common use.

This leads to some obvious questions which we will try to answer: Why are there so many different graphics file formats in use? What are the differences between them? Why is one file format

preferred over another in particular circumstances? Why do some file formats result in very large file sizes while others result in much smaller file sizes for a digital image which looks "almost the same" when displayed? How do you get a particular digital image stored into a binary file? How do you get the image out of the file?

Digital Image Basics

Think of a digital image displayed on a computer monitor screen as composed of a rectangular array of discretely addressable picture elements referred to as pixels. A full screen digital image on a standard computer VGA display, for example, consists of an array of 640X480, or 307,200 pixels. Other display types (e.g. SVGA) have different pixel dimensions for a full screen display. (Note: the basic notion of discretely addressable pixels forming a rectangular image array area on a computer screen has some similarities to the idea of controlling printed characters in discrete print positions on a continuous sheet RTTY system described above.)

The electronics associated with the monitor screen cause each pixel in the array of pixels (which defines the image area on the display screen) to be successively scanned and displayed in accordance with a particular digital image defined in the associated binary file. A digital image, of course, does not need to be displayed on a full screen basis, but can be displayed with arbitrary rectangular pixel dimensions, such as 180 X 120 pixels. Regardless of the particular type of computer display and regardless of the particular pixel dimension for the digital image, the binary computer file which defines the displayed digital image can be thought of as containing an "image" of the array of pixels with a particular "value" associated with each pixel to control exactly how each pixel is displayed.

Continuing to conceptualize in this manner, it should be apparent that a digital image formed solely from black or white pixels on the display screen would only require that either a "1" or a "0" (e.g. corresponding to "black" or "white" pixel) be stored as the value for each pixel position. This is the simplest and easiest example which illustrates the basic idea involved in a digital image display. We know from experience, however, that displayed digital images formed from purely "black" or purely "white" pixels are not particularly useful except for simple line drawings or other simple images and usually have a poor appearance.

A major improvement in the appearance of a displayed image, still without the use of "color", can occur if instead of using pure black or white pixels, the digital image is formed using a "grayscale" to define each pixel value. Grayscale images are the most common type of monochrome images you are likely to encounter in practice, and are commonly referred to as "black and white" images (even though not formed from purely black or purely white pixels). A grayscale defines each pixel value to be either pure black or pure white or at any one of a number of a series of permitted "gray" values in between the extreme (i.e. pure "black" and pure "white") values. For example, if we select an 8-bit grayscale value, a particular pixel to be displayed can have any one of 254 gray values or pure black or pure white (i.e. 256 total possibilities).

If we continue to imagine the binary digital image file as containing an "image" of the array of pixels, we then can understand that an 8-bit grayscale system requires that an 8-bit grayscale value be separately stored for each pixel position. This is a useful way to conceptualize how a grayscale image is stored, but fortunately as we will see later, there are efficient and practical ways to compress the size of a binary digital image file.

Many common graphic file formats use an N-bit "color palette" system instead of grayscale. The use of color improves the appearances of displayed images for most (but not all) image types. The use of a "color palette" image requires the use of a color computer monitor display, and associated display electron-

ics which supports the use of color. A particular "color palette" also must be defined for the particular digital image in the file. The monitor used with a typical personal computer system in today's ham shack now supports at least VGA or SVGA (800X600 pixels) with at least basic 8-bit color. Systems which permit a palette of 256 different colors are now in very common use. Such systems can be conceptualized (as with the 8-bit grayscale system) to require that an 8-bit pixel value be stored in the binary image file for each pixel position.

The True Color system which is also a standard for digital images requires that 8-bits be defined for each of the three primary colors (Red, Green and Blue), for each pixel position. We know that any arbitrary color can be formed by appropriate mixing of these three primary colors. The True Color system thus results in a potential range of 16.7 million colors ($=256 \times 256 \times 256$) at each pixel position, and can be conceptualized as requiring that a 24-bit pixel value ($=3 \times 8$ -bits) be stored for each pixel position.

Digital Image File Basics

The discussion of digital image basics above has emphasized the need to define a particular pixel value for each and every pixel in the displayed digital image. Indeed, this is exactly what the image display hardware needs to do in order to properly control the display. This "hardware" oriented viewpoint has provided a convenient and easy way to conceptualize what "information" is required to be contained in a binary digital image file, but represents an oversimplification which could be misleading if we were to stop here. An understanding of the basics of how practical digital image files are created requires some additional concepts.

One of the most important ideas already mentioned is that binary files containing digital images will have very large file sizes unless appropriate compression techniques to remove redundancy in the image are used when creating such files. A compressed file of a smaller size is preferred in most instances because it requires less space for storage and can be sent more quickly than a larger file over a given digital communications channel.

Another closely related concept is that the contents (i.e. the sequence of bytes) in a binary file can be processed under software control as the file is read by the computer. This means simply that a binary image file does not really need to contain a literal or even close pixel by pixel "image" of what the display hardware will ultimately require to control the display; the binary file only needs to contain enough "information" so that the pixel by pixel "image" ultimately required by the display hardware can be generated under software control from the contents of the binary file. These are key ideas needed for a basic understanding of why there are many different types of digital image file formats now in common use.

Raster and Vector Digital Image Files

Many types of digital image files exist, but most can be classified cleanly into one of two basic file types: raster graphics or vector graphics. Both of these basic file types are useful for particular and different purposes and it is helpful to understand the basic differences between them. Later in this series, we will describe digital image file types now in common use and classify them as raster or vector type files. (Some file types include both raster graphics and vector graphics characteristics.)

A raster graphics image file contains essentially "pixel oriented information" which can be read and manipulated to generate the pixel by pixel information required by the display hardware to create the display of the digital image. The pixel oriented information in a raster file does not contain information from which the image or parts of the image can be constructed by computation.

A vector graphics image file, on the other hand, contains numeric information about the image itself from which the image can be constructed by computation.

A simple example will illustrate the basic differences between these two basic image file types. Imagine a simple digital image consisting of a color line drawing of a square on a background having a different color. A vector graphics file for such a digital image would only need at minimum to contain numeric information about: (a) the size of the image field (2 numbers), (b) the background screen color, (c) the color for the line drawing, (d) the length of one side of the square, (e) the location within the image field of one corner of the square (2 numbers), and (f) the orientation (i.e. rotation angle) of the square. Thus, the simplest vector graphics file could be very small (e.g. less than 30 bytes) containing representations for only 8 number items from which the complete color image could be constructed by computation for display. A raster image file for such an image, on the other hand, would require a much larger file size even with efficient compression techniques to remove pixel to pixel redundancies in the image.

There are other differences between vector and raster files which should be apparent from this simple example. The size of the vector image file should not change if the image is modified (e.g. edited) to show the square in a different orientation, because only the number in the file for the rotation angle would need to be changed. The contents of a raster image file, on the other hand, would change dramatically because the pixel to pixel layout in the image would change as the rotation angle of the square changed. Other differences are also worth noting briefly: a vector image file may be easily rescaled in size by simple numeric scaling of the appropriate vector numeric values with full image fidelity retained upon rescaling; rescaling a raster image file, on the other hand, is

a much more complex process which may result in a permanent degradation of the image stored in the file.

We do not mean to suggest by this simple line drawing example that vector files are to be preferred over raster files for all image types because that is clearly not the case (as we will discuss later). But before moving on, I want to offer a quick observation from this simple line drawing example which relates to and illustrates something important about image "compression" techniques. Because the original raster image file and the original vector image file for this simple line drawing will appear "the same" when displayed on the computer monitor screen, the very small vector image file (e.g. 30 bytes) can be viewed as a highly "compressed" equivalent version of the much much larger raster image file! We will see later that achieving high quality image "compression" is usually not this easy!

Next Time

In the next installment, we will describe the important characteristics of several of the digital image file formats which are in most common use, discuss the different digital image types, and the preferred compression schemes applicable to each. We will also describe (with examples) how to use low cost computer input devices to capture complex digital images and several software packages (including shareware and freeware) which may be used for displaying, creating and manipulating (editing, enhancing, modifying) digital images.

Beedle Beedle

A series of digital snippets

by Crawford Mackeand, WA3ZKZ

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Standards and Non-Standards

The world is divided. Well, we knew that ... what else is new? How about the division into standardizers and non-standardizers. Apart from the fact that the words are much too long, getting close to antisestablishmentarianism which was an early day favorite for the title of longest, it is a real divide.

There is a definite plus to standards. It saves the cost of learning too much new stuff. Think of the time savings on learning curves if everyone used the same word processor. But on the other hand, contemplate also the miserable stagnation that would result if no-one was allowed, or able for whatever reason, to produce and try to sell, a new one. So it sounds as if I come down fairly hard on the side of the anti-standardizers. Well, I do, and as a recent American one of the things I like in this country is our stalwart defense of doing things our way.

But there's a flip side to that too. If you beat on people to conform, the one thing that you know will happen is that non-conformity will come out everywhere, people being people. Sticking my neck out, I will say that standardization is alive and well in Britain, which is not noted for its conformists. And vice versa here, where there is, or was, more conformity. (W6 is a separate issue.) No school uniforms, but everyone wears sneakers.

So what's all that to do with the DJ? Editor Jim wants some conformity. Hooray for Jim. Down with Jim! Seems to me that the only answer is to try for a happy mean, knowing that somebody will always disagree with whatever you do, and knowing that both extremes are good places to be from. Well away from. So here are the thoughts that I gave him. Late, but better late than never.

Honor the SI units. Hertzies and Bels. mA for milliamp and mV for millivolts etc etc. Oh yes. ms for milliseconds. mS is for milliSiemens (which used to be millimhos back in antique times.) We will be in good company there. IEE IEEE etc.

Next, where there is an established owner's choice, like OS/2 RagChew or SNAPmax, Pactor (I think) etc. treat it like a trade name (maybe it is) and don't mess with it.

Then set a couple of categories for abbreviations like afsk, rom, svga etc. Then caps for organizations, ARRL, IDRA etc., and also for Q-code and the old CW abbreviations (SK, CQ etc.)

And time honored sanctity for a few. GMT, RTTY, DOS

There you are. I have it off my chest, hope he liked it!

73 de Crawford. WA3ZKZ

A Less Shocking Tuning Scope

A Homebrew Project

by Carl Steavenson, K6WZ

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The homebrew bug bit while I was reading the comprehensive series on tuning indicators by Bill Henry, K9GWT (DJ, Sept thru Dec. 1995). When I built a 2AP1 scope some 13 years ago (RJ, Sept. 1991) I noted that deflection increased with decreased accelerator voltage. This bears out comments made by Bill in the November, 1995 article. Experiments led to building the scope pictured which operates FB at voltages as low as 300V. Below 300V, intensity begins to suffer noticeably.

The reduced voltage requirement should make a homebrew project more attractive to some operators and simplifies power supply details. Almost any small BC radio transformer should do the job.

The new scope and power supply are assembled in a recycled 3x5x10 inch chassis having a few extra unused holes. The shield was not necessary but provided a clamp for the 2AP1 socket. Spare CRTs were on hand and fortunately a socket was made available by Jay, WS7I from his apparently well-stocked junkie box (Jay writes in January, 1996 DJ that he also has 88 mH toroids on hand).

The divider string and toroidal filters are mounted on a 3x6 inch perf board. The CENTERING and FOCUS control shafts extend through clearance holes in the left hand side of the chassis. If metal shafts are used they should not be allowed to contact the chassis—breakdown could occur. Voltage at the INTENSITY control is very low, however, permitting this pot to be mounted on the front panel along with a line switch. The 7.5k unit used is just what was available at the moment equipped with a switch. Resistance of 25k or 50k would give greater range.

As for the filters, I was either lucky or more careful when assembling the toroids and added windings in the old scope. This time, signal level was much too low for acceptable deflection. I added the 30 turns as a "primary" or link over the original 88 mH winding as before, but finally had to pull both of the new filters and rewind. Now I was careful to a) wind the 30 turns in the same direction as the 88 mH turns; b) spread the 30 turns around almost all of the circumference, and c) terminate the "hot" ends of both windings at the same point (ditto the grounded ends).

Final tests with my venerable AEA CP-1 demodulator yielded substantially the same results from both old and new scopes, with one difference of consequence: the mark trace obtained from the new scope was too long and narrow whereas the space pattern was a nicely formed ellipse as desired. The filter was too sharp. I used .064 uF in the new mark filter versus .067 in the older scope. The .064 capacitance is correct for 2125 Hz and 88 mH but apparently did not allow enough spillover from the space channel to open up the ellipse. Installing a 33k swamping resistor across the mark filter yielded a shorter and fatter ellipse comparable to the space pattern.

Outputs from the CP-1 mark and space connectors are adequate for desired deflection without the need for amplifiers. A modification helped, however. Bridging R46 and R49 as shown in the schematic both increased the outputs and corrected the angular displacement of mark and space traces to 90 degrees. As supplied,

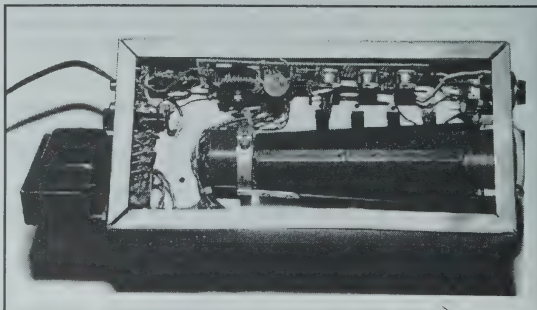
the CP-1 traces will be about 75 degrees relative. I have added the newer CP-100 as backup and it appears that amplifiers will be required as well as a correction of the angular relationship. I am currently trying three approaches. 1) The LM 3900 which appears to be similar to a quad 741 (Jul-Aug 1977 RJ);

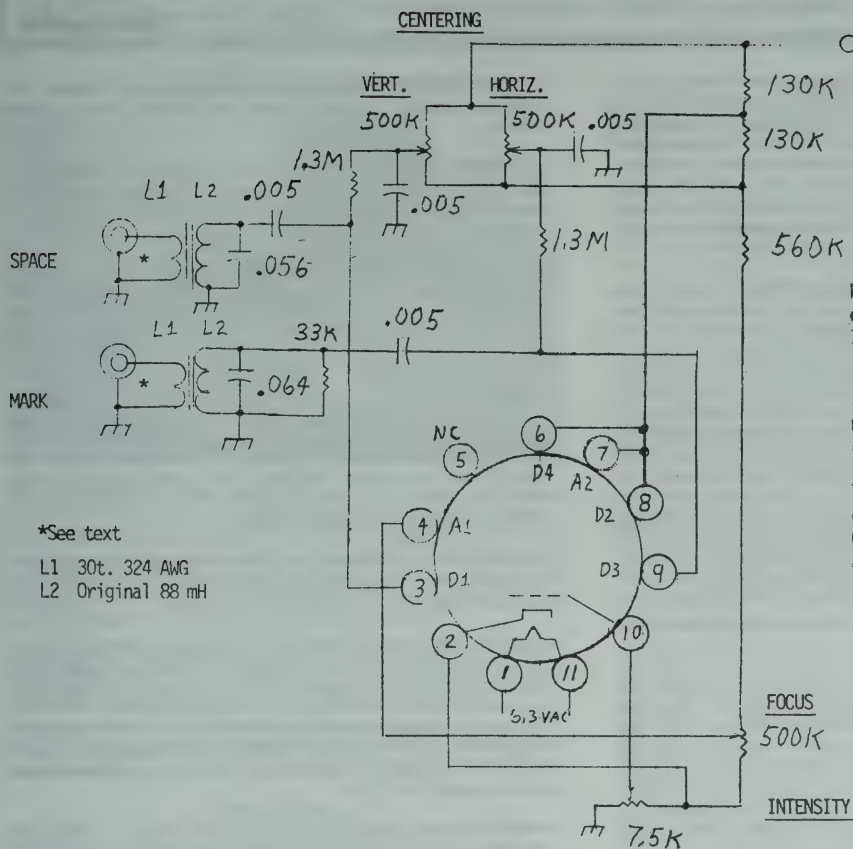
2) A pair of LM 368. 3) Topping both may turn out to be a pair of surplus boards found in a California store years ago for a dollar each. These were made in Ireland for some audio project and boast a "Darlington pair" (contains emitter follower) for 4000 ohms in and 16 ohms out.

The shroud was liberated from the aerosol can that supplied the paint and was modified with a hack saw. Spring clips fashioned from a coil spring hold the shroud in place. (It's a homebrew project).

A word of caution about the power supply and transformer: the transformer filament voltage should be checked under load. I found mine to be high by more than a volt. A bleeder resistor should be used at the supply output. The divider string bleeds the capacitor very slowly. Pull the line plug before working on the unit.

The 2AP1 is still available from at least one surplus dealer for \$15. The same source lists the 1EP1 and 3BP1 "NEW" at reasonable prices.





○ 300-380 VDC
See text

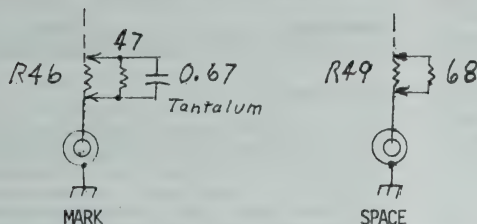
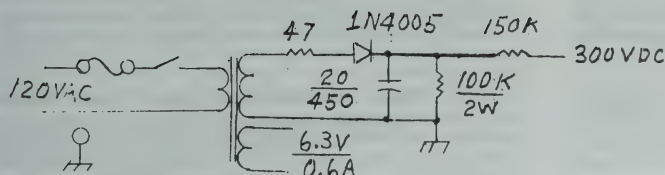
Resistor values not critical. 130k can be 100k, 1.3M can be 1.0M.

Resistors in divider string are 0.5W composition. Others may be 0.5W film unless otherwise indicated.

The .056 and .064 uF capacitors are polystyrene. Others may be ceramic except as indicated.

*See text

L1 30t. 324 AWG
L2 Original 88 mH



Modifications at R46 and R49 in CP-1 corrected angular displacement to 90 degrees and increased output to scope.

(Cont'd on page 30)

DX News

The latest digi-doings from around the globe

by Don Hill, AA5AU PO Box 625, Belle Chasse, LA. 70037 • email: AA5AU@aol.com



The day after I e-mailed the March column to Jim, there were two major developments in the RTTY DX world. Before I go into those I want to make a change in my articles. I sometimes struggle between using the term *RTTY DX* and *Digital DX*. Are we *RTTY DXers* or *Digital DXers*? Of course, we are both. But with most DXing on the *Digital* modes being done on *RTTY*, all the DX mentioned in this column should be referred to as being *RTTY DX*, unless otherwise specified. And believe me, there are times when you just might snag a good one on a digital mode other than *RTTY*. Here is a good example:

On February 6, 1994, the 3Y0PI Peter Island DXpedition came up on the digital modes for the very first time and it was on Amtor FEC. This is how it happened. One of the crates carrying the RTTY gear was damaged. Tony, WA4JQS, salvaged what he could of the mess. From parts of two damaged PK232's, he managed to get the PK900 working, but only on Amtor. The DXpedition had been going on for six days and everyone was waiting on RTTY. Around 0035z Tony started calling a station in the Falklands on 15 meter Amtor FEC. He was trying to get information on what needed to be done to the PK900 to make it work on RTTY. There was no answer from the VP8. All this was being observed by a station in south Louisiana. The USA station called Tony on FEC and was promptly answered since Tony was an acquaintance of the caller, and was glad to see that he was being heard at all. Thus, the first ever digital QSO from 3Y0PI was on Amtor, and I must admit, it was my best ever *Digital DX* QSO! Tony did eventually get the RTTY part of the gear going and exhausted the need for Peter I. So in your quest for DX, don't neglect those other modes available to you in your HF modem.

That brings us back to one of the most important developments in the race to Heard Island. WA4JQS leads the South Sandwich Island DX Group (SSIDXG). The other group is headed up by Peter, ON6TT, and Bob, KK6EK. In early February, Tony released a statement for the SSIDXG saying they would, for a second time, step aside to allow the other group to proceed. Even though the SSIDXG was scheduled to land a month ahead of the other group, a decision was made for the betterment of our hobby. The SSIDXG is now focusing their efforts on other rare Antarctic locations. The SSIDXG's decision shows the honor that exists in our sport of DXing. Not only that, look at all the rare one's down there. Here is a list of the other DXCC countries available for a major DXpedition to the Antarctic region.

3Y	Bouvet	FT8Z Amsterdam & St. Paul	VP8/G South Georgia
3Y/P	Peter I	KC4 et al Antarctic	VP8/H South Shetlands
FT8W	Crozet	VK0/M Macquarie	VP8/Q South Orkneys
FT8X	Kerguelen	VP8 Falklands	VP8/S South Sandwich

Also in February there was a full scale announcement by the Central Arizona DX Association (CADXA) for their planned DXpedition to Myanmar (XY, XZ). They will be QRV April 2-11. Of major interest is the inclusion of Vince, K5VT, as one of the operators. Last year at Dayton, Vince was named *DXer of the Year* by the Digital Journal. Having a top-notch DXpedition operator on the other end will enhance our chances of getting this one in the log. The other RTTY operator slated is Jack, WA7LNN, also pretty good on the keyboard. A Finnish DXpedition scheduled for XZ was cancelled at the last minute in mid-February. There was concern as to how this might affect the CADXA group. Apparently, any problems have been ironed out and as of last month, they were still a "go". For more information on this DXpedition, refer to the CADXA web page at <<http://www.get-net.com/%7Edavidh/cadxa.html>>.

Digital Doings

BAHRAIN, A9. Bob, A92GD, has taken to RTTY contesting. He was worked during this year's WPX. QSL via K1SE.

BELARUS, EV, EW. EV10D has been quite active on 20 meters. QSL route given by the operator, Valentin, is: Box 55, Mozyr, 247760 Belarus.

BOTSWANA, A2. Lothar, A22BW, also made an appearance in the WPX contest. Lothar has been active on RTTY for many years, but had been missing from the keys lately. Glad to see he is back. QSL via DK3KD.

CAPE VERDE ISLANDS, D4. Carlos, D44AC has been active on 20 meters. Carlos is new to RTTY. In a QSO with Scott, KB3X, he said he was running an MFJ TNC and needed some help. If anyone can help, drop him a note. QSL to Carlos Pulu, POB 398, Mindelo, Cape Verde Islands.

CHRISTMAS I., VK9X and COCOS-KEELING, VK9C (formerly VK9Y). There was a major DXpedition in February that included a good amount of RTTY activity. A German group activated both Christmas I. (VK9XY) and Cocos-Keeling I. (VK9CR). Band conditions were harsh to them from both locations, but they put on a great show on CW and RTTY. Congrats! QSL cards go direct to DK7NP at: Rudi Hein, Am Uferholz 7, D-96047 Bamberg, Germany.

ESTONIA, ES. Henry, ES7FQ, is back on RTTY with his usual booming signal on 20 meters after a long absence. QSL direct: Heiki Palusaar, Puiatu Loigu, Viljandi EE-2961, Estonia.

IRAQ, YI. The sudden activity from Iraq on all modes starting in January, slowed only slightly in February and March. It is still unclear what has caused this increased activity. It seems YI stations can be found almost daily on 20 meters from 1000-1500z around 14085 kHz. Glad to have them back with us. Many of the operators, including Razaq Y11ZN and Adel Y11FC, are giving out the same QSL route via PO Box 55072, Baghdad. However, Y11HK has been reported to have a QSL manager, SM5DBU.

MARION ISLAND, ZS8. Chris, ZS5IR/ZS6RI, will sign ZS8IR starting early May 1996 through June or July 1997. He will operate 160 through 6 meters with CW, SSB and RTTY. Here's a country we have not seen in many years. Get him while he's there for a whole year! QSL via ZS6EZ.

SOUTH COOKS, ZK1. Paul, WT8S, made a show as ZK1WTS around in mid-February. He complained of the poor band conditions over the air and how he was tempted to go to the bar where there were girls in grass skirts. Instead, he hammered away at the keyboard to give out contacts under poor band conditions on 20 meters. There's a dedicated DX'er! QSL to his home address as follows: WT8S, Paul W Daley, 8029 Ashland Ct., Canal Winchester, OH.

SVALBARD, JW. The JW6VDA DXpedition in March made an appearance on Pactor. QSL via LA6VDA.

ZIMBABWE, Z2. Look for James, Z21CA, on 20 meters. QSL to: James Finch-Smiles, Private Bag T-5400, Bulawayo, Zimbabwe.

The Internet and DX

Ah, yes, everyone is talking about the Internet. E-mail this, web-site that, download from FTP, and Telnet to the DX Packetcluster. For those of you not yet on the Internet, these are frightening words for basically simple events. It doesn't matter if you are a casual DX'er or fanatic like me, there is literally a world of information available. If you are not on the Internet in some way, you are missing a lot. Next month I hope to touch on a few hints that will make your Internet connection more useful in chasing DX. Remember, DX never sleeps.

The International Scene

A regular look at the odds & ends from around the digital globe

Edited by Jim Mortensen, N2HOS



VP8/VP8/VP8/VP8



Bob VP8BFH (see picture) reports that his XYL Danuta (many of you met her at Dayton two years ago) has been in the UK for the past five months. She developed cancer of the breast, had surgery there, and remains as she undergoes extensive treatment. Needless to say it has been a lonesome summer (remember they are south of the equator) for Bob and surely a very lonesome winter for Danuta. We wish her a safe and speedy return to Port Stanley.

The dog in the picture is a survivor amongst a threatened breed. They've survived in the unspoiled Falklands for over 80 years, but fall prey to disease more easily than most. Beautiful animals!

Good friend Bob also reports that he is awaiting his P38, so there goes another country! Good to hear from you, Bob and, yes, the calendar is safely displayed on the shack wall. Thanks.

G0/G0/G0/G0

Here's what happens when two veteran keyboarders start exchanging messages via the Internet: "Hello Jules (W2JGR—Ed), long time no QSO Hi. Re: Feb. Digital Journal, page 5. WAS-RTTY etc. Like most RTTY freaks I had to find something to occupy my fingers while waiting for new countries to show up so I hammered away at a few awards and had a lot of fun in the process.

The result of this diversion from DXCC Honour Roll and 5BDXCC (all RTTY) is as follows:

Worked All States. RTTY Journal, certificate of merit No. 18 signed by Betsy WV7Y dated June 1990.

CQ Journal, Worked All CQ Zones RTTY No. 84, dated November 1993.

First IOTA-100 all RTTY July 1993. (now 180 cfm), hoping to be first IOTA-200 - all RTTY.

First RSGB Commonwealth Century Club all RTTY December 1994.

RSGB IARU Region 1. Class 1. all RTTY, January 1995.

My attempt at DXCC Honour Roll still grinds along slowly with 295 cfm. 5BDXCC even slower, needing 40 & 80 meters topping up with 30 plus countries but I am not ready to start thinking about giving up yet.

Always enjoyed reading your column so will be sorry to see you moving on. All the very best of luck with your future plans and may all your DX be new ones.

de Bob G0ARF. Eard Island.
GB2ATG news editor for BARTG."

A41/A41/A41/A41

Here's a new country for IDRA! (and for you satellite and Clover keyboarders). Tom and Joost ZS5S are regularly linked, so watch for this new signal. "Thanks for your message about IDRA. I would like to join the group and receive the IDRA/digital journal. Please start my subscription immediately.
Thomas L. Frazee, A45ZO (WA7QED)
P.O. Box 3 • Ruwi, Sultanate of Oman, Code 112.
73's Tom, a45zo.mct.omn.mdle
I am also active on KO-23, KO-25, and UO22."

DL2/DL2/DL2/DL2

Tom Rink DL2FAK, of SCS, promises an update on Pactor II for the May issue. "I have now started to write an article for the Journal that explains some of the most interesting novelties of the firmware release V.1.12.

VE3/VE3/VE3/VE3

Another brand new member brings some expertise to the table as well. George Neeson VE3BDM sent along an explanation of his activities in the NTS world. He's a busy guy! Thanks for the invitation, George, but I think my winter months are already filled with appointments of one kind or another!

"Well, I got the Express 3.5 program and it looks like a real winner. Just installed it last night and finally have something that pushes the P38 board to its potential. It's going to take a while to learn a complex program, but sure enough, it says in the install.txt that it is fully compatible with Winlink and at 0130 local I connected with Ron N2JAW in Holland Patents, NY (the NTS guru in this corner of our two countries) and it linked real slick and looked for NTS traffic. You asked what I do on NTS. Well, more than the XYL of 35 years is happy with! But Eunice is a great lady and endures the NTS widowhood with patience. I am section traffic manager for all of Ontario (hate to tell those Texans this because we are a whole lot bigger). I operate CW, phone and am known here on the NTS nets as 'Mr. Digital,' although I am not the first NTS guy to use digital. I go CW Section, Region and sometimes to Area nets, and although not totally comfortable on 3.652 I can do it if they will hold it down to 35 wpm (well, heck, it's cold up here and the hands get stiff, Jim). I am NCS on two traffic nets and one night a week on the Section net.

I have been trying to establish a dedicated unattended NTS digital operation based on the P38, so now I can be up and running. I just have to figure out the auto-routing thing which I believe Express can do and it's a go.

Thanks for the help and any time y'all get too hot in that darn Florida summer sun, take a run up here. Your bucks have huge buying power here and you'd be welcome in our home (even in winter HI)."

FAIRS/FAIRS/FAIRS/FAIRS

Special Event Promotion. The Foundation for Amateur International Radio Service (FAIRS) will operate KK4WW, US5WE, BY1QH, 8R1WD and S21AM in their own countries on May 11th and 12th to celebrate the 5th anniversary of FAIRS. They will operate in the general portion of the 40, 20 and 15 meter bands. For certificate send QSL and 9X12 envelope to FAIRS, PO Box 341, Floyd, VA 24091.

Let's turn out and support this worthy group, by our actions and by our contributions. The promotion is not a digital event, but this is the group that set up the Ukrainian Digital Amateur Network, the repeater in Guyana, etc. Get the full story from their website at <david.larsen@fairs.org>

Contesting

Coming Events and Awards

by Rich Lawton, N6GG • 14395 Bevers Way • Pioneer, CA 95666



— RTTY Contests - Coming Events —

	Date:	Contest:
APR 6-7	EA WW RTTY	(Spanish)
APR 27-28	SP DX RTTY	(Polish)
MAY 4-5	ARI International DX	(Italian)
MAY 11-12	VOLTA RTTY DX	(Italian)
JUN 8-9	ANARTS WW Digital	(Australian)
JUL 13-14	BARTG AmTOR/Pactor	(British)
JUL 20-21	North Amer. QSO Party	(USA)

NOTICE: Two NEW contests have been added: "**ARI International DX**" and "**North American QSO Party**". RTTY was added to The ARI International DX in 1994, but got little publicity because it was just 1 week before the popular ARI VOLTA RTTY. The NAQP is a popular *cw/ssb* and has just announced a new, separate NAQP RTTY contest. It is sponsored by the National Contest Journal. Rules for both contests are similar to their *cw/ssb* equivalents. Also note that DARC HF RTTY, Part II on July 20-21 has been cancelled.

— Reminders for Logs —

BARTG Spring RTTY (March 16-17) Logs must be received by May 31, 1996.

Mail logs to:

John Barber G4SKA
Box 8, Tiverton
Devon EX16 5YU
ENGLAND

— — COMING UP: — —

— EA WW RTTY Contest — 6-7 April 1996

Sponsored by Seccion Territorial Comarcal De Aranda De Duero.
(Ref: EA1MV)

CONTEST PERIOD: From 1600Z Saturday to 1600Z Sunday.
(24 hours)

BANDS: 80, 40, 20, 15, and 10M (five bands)

CLASSES: A) Single op, all band C) Multi-op, all band
B) Single op, single band D) SWL.

EXCHANGE: EA stations send RST + Prefix of province.
All others: sent RST + CQ Zone

MULTIPLIERS: Each DXCC Country and Spanish Province on each band. Spanish Provinces are: A, AB, AL, AV, B, BA, BI, BU, C, CA, CC, CE, CO, CR, CS, CU, GC, GE, GR, GU, H, HU, J, L, LE, LO, LU, M, MA, ML, MU, NA, O, OR, P, PM, PO, S, SA, SE, SG, SO, SS, T, TE, TF, TO, V, VA, VI, Z, ZA.
(There are 52 EA provinces)

NOTES:

- 1) All multipliers count once per band (Band Multipliers).
- 2) First QSO with EA station on each band counts as an additional multiplier, along with province.
- 3) CQ Zones now count as multipliers. (new this year)
- 4) QSOs with stations in your own country are valid for multiplier credit but have ZERO QSO point value.

QSO POINTS: On 20, 15, and 10M: Count 1 point for each QSO on your own continent, and 2 points for for the rest. On 80 and 40M: Count 3 points for each QSO on your own continent, and 6 points for the rest.

FINAL SCORE: Total QSO points x total multipliers.

AWARDS: Plate to winner in each class. Certificate to winner in each DXCC country in each class. (Must have 50 or more QSOs.)

LOGS: Use separate logsheets for each band. Include a Summary sheet to show scoring and other essential information.

DEADLINE: Mailing deadline is June 9. Mail entry to:

EA RTTY Contest Manager
Antonio Alcolado, EA1MV
P.O.Box 240 • 09400 Aranda de Duero (Burgos)
SPAIN

COMMENTS: This is a 24 hour contest. CQ Zone now counts as multiplier on each band (new this year). Point bonuses encourage low band operation. This contest uses band multipliers - work the same country on different band gives a new multiplier. **QSOs with stations in your own country are valid for multiplier credit but have ZERO QSO point value.** Use separate dupesheets and multiplier sheets for each band. **Handy tip:** make an alphabetical checkoff list of EA Provinces for each band, as they do get confusing when changing bands.

— SP DX RTTY CONTEST — 27-28 April 1996

Sponsored by: Polski Związek Krotkofalowcow (PZK).
Organized and run by Polish Radiovideography Club (PK RVG).
(Ref: SP2UUU)

CONTEST PERIOD: From 0000Z Sat. to 2400Z Sun. (48 hours)
Single ops allowed only 36 hours operation.
No restrictions on length of rest periods.

CONTEST CALL: "CQ SP RVG TEST" **MODE:** RTTY only
BANDS: 80, 40, 20, 15, and 10M

CATEGORIES: A. Single Operator, All Band C. SWL
B. Multi-Operator, All Band D. SP stations

MESSAGE EXCHANGE:

Send: RST + QSO number, starting with 001
SP stations send: RST + Province (2 letters)

NOTE: Polish stations will use a two letter abbreviation of their province. There are 50 SP provinces.

MULTIPLIERS: Count each DXCC country, including 1st QSO with your own country. Also, 1st SP station, and each SP province on each band. (Band Multipliers) Also, each continent (6) will count once, not once per band.

BONUS: "Special SP stations with suffix RVG will be "Joker" in multiplier (new country or continent.)" To me this means if you QSO an SP station whose suffix is RVG, count it as new multiplier.

QSO POINTS:

- Count 2 points for QSO with own country
- Count 5 points for QSO with other countries on your continent.
- Count 10 points for QSO with countries not on your continent.

FINAL SCORE: Total QSO points x total mults x number of continents (max 6). SWL rules apply as above.

LOGS: Use separate log sheets for each band. Logs must show: BAND, DATE and TIME in UTC, CALLSIGN, MESSAGE sent and received, country multiplier and points claimed. Entries with more than 100 QSOs must submit duplicate check sheets. Multiple operator stations should include names and callsigns of all operators. We invite you to submit logs on computer disk. The format we prefer is CT.BIN file (K1EA), or RTTY by WF1B.

AWARDS: First place plaque to top winner in all classes, 1st thru 3rd place winners will receive certificates in each class and in each continent. NOTE: Awards will be issued based on participation of 20 or more entries in each class.

DISQUALIFICATION: Violation of the rules of the contest or taking credit for incorrect QSOs or multipliers, or duplicate contacts in excess of 3% of the total made, will be deemed sufficient cause for disqualification. The decision of the SP DX RTTY Contest Committee are final and not contestable.

DEADLINE: Logs must be received by 15 June to qualify. An extension may be granted if requested. Mail logs to:

SP DX RTTY Contest Manager
Christopher Ulatowski, SP2UUU
P.O. BOX 253
81-963 GDYNIA 1
POLAND

COMMENTS: Watch for BONUS mult for QSO with SP station whose suffix is "RVG."

NOTE: Everyone, mainly W/VE stations: don't forget to count 1 multiplier for your first domestic QSO on each band.

— ARI International DX Contest — May 4-5, 1996

Sponsored by Associazione Radioamatori Italiani
(ARI) (Ref: I2UIY)

CONTEST PERIOD: Starts at 2000 UTC Saturday, ends at 2000 UTC Sunday (24 hours)

No time out periods.

MODES: cw, ssb, and RTTY. **BANDS:** 160, 80, 40, 20, 15, 10M. (No RTTY on 160M)

CATEGORIES: a) Single Op - cw d) Single Op Mixed
b) Single Op - ssb e) Multi-Op Single Tx, Mixed
c) Single Op - RTTY f) SWL - Single Op - Mixed

NOTE: RTTY Contesters who have cw and/or ssb abilities also have a significant advantage by operating in the "Mixed" Category. (Three QSOs per band - but QSOs must be more than 10 minutes apart. See "Penalties and Disqualifications" below.)

EXCHANGE: Italian stations send: RST + 2 letters to identify their province.

All others send: RST + serial number, starting with 001.

MULTIPLIERS: Each Italian province (103) and each DXCC country except I & IS0.

Each multiplier counts only once per band, regardless of mode. This means there are band multis but no mode multis.

The 103 Italian provinces (by call area) are:

I1: AL, AT, BI, CN, GE, IM, NO, SP, SV, TO, VB, VC.

IX1: AO

I2: BG, BS, CO, CR, LC, LO, MI, MN, PV, SO, VA.

I3: BL, PD, RO, TV, VE, VR, VI.

IN3: BZ, TN.

IV3: GO, PN, TS, UD.

I4: BO, FE, FO, MO, PR, PC, RA, RE, RN.

I5: AR, FI, GR, LI, LU, MS, PI, PO, PT, SI.

I6: AN, AP, AQ, CH, MC, PS, PE, TE.

I7: BA, BR, FG, LE, MT, TA.

I8: AV, BN, CB, CE, CS, CZ, IS, KR, NA, PZ, RC, SA, VV.

I0: FR, LT, PG, RI, ROMA (or RM), TR, VT.

IT9: CL, CT, EN, ME, PA, RG, SR, TP, AG.

ISO: CA, NU, SS, OR.

QSO/POINTS:

- QSO/HRD with own country = zero points but counts for multipliers.
- QSO/HRD with own continent = 1 point.
- QSO/HRD with other continent = 3 points.
- QSO/HRD with any Italian (I & IS0) station = 10 points.

NOTE: Same station may be QSOd on same band once with any mode (ssb/cw/RTTY)

but only the first QSO would count as a possible new multiplier.

FINAL SCORE: Total QSO points x total multis. SWLs use same rules as QSO ops.

LOGS and SUMMARY SHEETS: Use separate logsheets for each band. Logs must show: BAND, DATE and TIME in UTC, CALLSIGN, MESSAGE (sent and received), country or province prefix, and QSO points claimed. Summary sheet must show: callsign,

name and address, class of entry, callsigns of other operators, all scoring details, and a signed declaration of abiding by all the rules.

LOG DEADLINE: Logs must be postmarked within 30 days of contest. Mail to:

ARI Contest Manager
Paolo Cortese, I2UIY
P.O. Box 14
I-27043 BRONI (PV)
ITALY

PENALTIES AND DISQUALIFICATIONS: Disqualification may apply for:

1. Excessive number of unmarked duplicates (more than 2%)
2. Violation of the "10 Minutes Rule" (either for band or mode).
3. Excessive declared score (more than 5%).
4. Log without summary sheet.

Penalties may apply for:

5. Each duplicate contact removed by the Contest Committee costs 3 QSOs.
6. Each multiplier counted twice or more on same band costs 2 multipliers.
7. Each non-existing or unverifiable station logged costs 5 QSOs.
8. Instead of disqualification of a log, the Committee may decide to penalize by erasing a percentage of its score.

AWARDS: A plaque with a certificate will be awarded to top scoring station in each class. Special plaques can be awarded by the Contest Committee if country/continental/call-area participation will justify the decision. A certificate will be awarded to No. 2,3,4, and 5 top scoring stations in each class as well as to the top scoring stations in each country in each class.

SPECIAL AWARD: Two very attractive, large size plaques will be awarded by Santa Barbara Contesters to keep alive the memory of I3ANE, Pietro Fiorito. The plaques will be assigned to:

- Best score achieved by Operator under 21 years of age.
- Best score achieved by SWL under 18 years of age.

In order to qualify for these awards, entrants must clearly state their age and birth date on the summary sheet.

LOGS ON DISKETTES: Logs on diskettes are very welcome and accepted in substitution of paper logs. Accepted formats are: N6TR, K1EA, ASCII, as well as the MS/DOS software distributed FREE of cost from the Contest Committee. A printed summary sheet must always be enclosed.

The free software can be used in either real-time or after the contest. It calculates points, multipliers and score. You have to type in the callsign and received report. It prints logs, summary sheet and dupe sheets as well as QSL labels. It has PacketCluster capability. An updated version is now available, revised and modified. The software can be received by sending to the Contest Manager \$5 us dollars or 10 IRCs to cover diskette and postage expenses.

COMMENTS: This contest has been around for a while on cw and ssb. RTTY was added in 1994. It occurs just 1 week before the popular VOLTA RTTY DX Contest, and has 103 additional Italian prefixes to keep track of on each band. It's a 24 hour-no-rest-periods contest with plenty of things to keep you busy. If you decide to go all mixed up, don't forget that RTTY software won't work on cw or ssb, and verse visa. Separate logsheets are required for each band. Though no mention is made of Packet Assisted QSOs, presumably that would count as Multi-op Single Tx, Mixed.

— VOLTA RTTY WW Contest — 11-12 May, 1996

Sponsored by SSB and RTTY Club of COMO, and A.R.I. (Associazione Radioamatore Italiani) honoring Italian discoverer of electricity, ALESSANDRO VOLTA. (Ref:ARI, I2DMI)

CONTEST PERIOD: from 1200Z Saturday, to 1200Z Sunday. (24 hours, no rest periods required)

BANDS: 80, 40, 20, 15, and 10M.

CLASSES: A1 - Single op, all bands
A2/xx - Single op, single band (xx = band)
B - Multi-op, single transmitter
C - SWL.

EXCHANGE: Send: RST + QSO nr. + CQ Zone nr.

MULTIPLIERS: DXCC Country List + each call area in VK, VE,

and USA. DO NOT COUNT VK, VE, or USA as separate country. (USA stations with callsign from one district but are now living in a different district should give proper identification, such as: K6WZ/0.) The same multiplier counts again on a new band. An additional multiplier is given for each INTERCONTINENTAL COUNTRY worked on at least four bands. Contacts between stations within the same country will not be valid, such as: A W2 station can work W1, W3, W4, etc. but not W2. Contacts made OUTSIDE one's own continent on 80 or 10M are worth double QSO points. A contact with a station that would count as a multiplier will only be valid if that station appears in at least 4 other logs, or a contest log is received from that station.

FINAL SCORE = total QSO points x total mults (band mults + each INTERNATIONAL COUNTRY worked on 4 bands) x total number of QSOs. Use Exchange Points Table to determine points scored for each QSO.

AWARDS: A SPECIAL trophy will be awarded to the top stations in each class. In addition, a certificate with special sticker to all entrants.

LOGS: Use separate logsheets for each band. Logs must show: BAND, DATE and TIME (UTC), CALLSIGN and MESSAGE Sent and Received, POINTS and NEW MULTIPLIER PREFIX. Summary sheet must show full scoring, and list of multipliers worked.

Logs must be received by July 30, to qualify. Send logs to:

Francesco Di Michele, I2DMI
P.O. Box 55
22063 Cantu
ITALY

COMMENTS: This is a 24 hour contest. The QSO points are determined by the EXCHANGE POINTS TABLE. This table, based on the 40 CQ Zones, is arranged so that the further away the QSO is from your zone, the higher the points scored.

NOTES:

- CQ zones DO NOT count as multipliers.
- Since W/VE/VK call areas count as separate countries on each band, CQing will be the best way to make a good score for W/VE/VK ops. Band multipliers will spread out the CQing, too, and should make the low bands more active.
- Don't forget to try working DX on 40 and 80M, as QSO's with countries on other continents will increase your multiplier if you manage to work those countries on the high bands.
- QSO's outside your own continent on 80 and 10M are worth double QSO points. In This contest uses the number of QSO's as an additional multiplier, and that creates astronomical scores... millions!

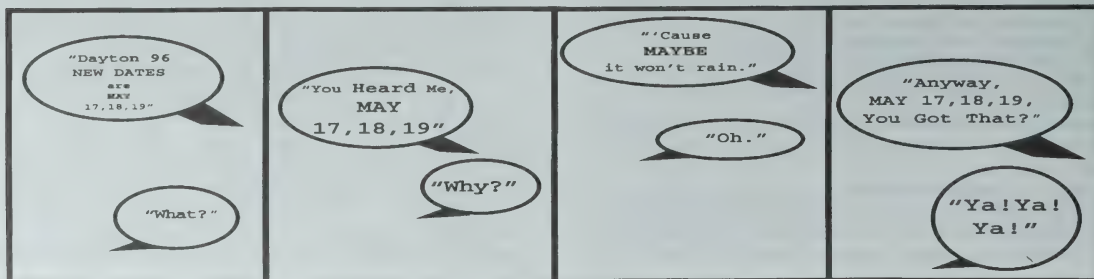
I received the following "Reflections" from John, GW4KHQ. I really enjoyed it, and I think you will, too. This is copied exactly as he wrote it...

REFLECTIONS FROM ACROSS THE POND: IDRA '96 WPX TEST

by John Woodland, GW4KHQ

At last we're off, after one false start a week earlier when I'd thought the bands were completely dead until I found a magazine

1996 DAYTON HAMVENTION



that indicated contest starts on 10 February.

What a wonderful first two hours. I've never worked 20 stations per hour before. 80 and 40 seemed wide open, working into states and collecting 6 points plus a multiplier each time. Time for bed at 2am, elated with my progress so far. Up at 8, 20 Metres to Europe with JA and 4X as extra points. Worked my Welsh competitor and friend, Glyn, GW0ANA. I'm ahead of the game. Hooray! Keep going, now I know he's there I must try harder, no automatic certificate for me this year. GW8GT is ahead of me but in a different class.

Lunch arrives, Chili Con Carne with first US stations for afters. What a wonderful wife, exotic food followed by a desert of DX.

Mid afternoon still working occasional East Coast among the Europeans, then four W7s in one hour around teatime. This is great, aerial must be connected and working full stretch for this contest. Yes, in the past I've operated half a contest with about 8 feet of my vertical missing because of an oxidised connection.

Worked my first VE and then a break for tea, after all I'm only allowed to work 30 hours and I don't want to do it all in one day. Shall I go to the pub for a beer. No, back to the keys at 8pm, break open a can of beer. 80 Metres open already, Europe only, then to 40 Metres at 10pm, 7 East Coast in a row. Can't believe this, like winning the lottery. Back to 80, more East Coast until midnight, then quiet. What a day, exhausted to bed at half past midnight.

Day 2, crawl out of my pit at 8.45am. On 40 by 9am, a bit quieter this morning on all bands, funny this normally happens on Sunday afternoon, where are all the Italians, perhaps I worked them all last contest. Manage to work a few stations on 15 Metres, tentative call on 10, why am I wasting time? Break for lunch after a gruelling morning, chicken with a delicious sauce. What a woman!!!

This is better, afternoon session livening up. Where on earth is CK2? Mainly 20 Metres with some 40 and rare 15 Metre contact.

Back on 40 at tea, on to 80. Not bad, steady rate of contacts but "DUPE" appearing far too often for my liking. Some stations even tell me I've worked them before, no time to argue, press on.

After 9pm, things really do get quiet, constant calling on 40 and 80 with very little response. Decide to sit on a frequency for the remainder of the contest. Thanks to G5LP, Lionel, for coming on air for my last multiplier just before my last contact, IK4QIB at 2328.

All in all, a great two days for me. Never worked more than 300 in one contest before, that's 10 per hour on average. Must find a way to improve next year. Thank you all.

GW4KHQ runs a Kenwood TS950 Digital into a Butternut HF6V vertical. Terminal Unit is a BARTG Multyterm to a 486SX computer using software by WF1B (Thank you Ray).

((73)) See you in the pileups, Rich, N6GG

P.S.

Drop me a line with an idea to share,
Or, drop me a line with an item to air.
Drop me a line with anger to bare...
But don't drop ME... 'cause I care!

The Contest Chair

Hints, Tips & Inspiration for Better Scores

by Ron Stailey, AB5KD • 504 Dove Haven Dr • Round Rock, TX 78664
Internet: <ab5kd@easy.com>



Hello Contesters and DXers. The month of April brings us two contests: the EA on the 6th/7th and the SP on the 27th/28th. Conditions are down somewhat but all contests deserve our participation. The EA contest doesn't allow us to work each other for districts, but normally EA8, EA9 are around on all bands. SP is a contest some of us haven't been able to participate in because of the Dayton Convention. That is all changed now, so here is a good chance for some of you to get into a new contest you have never participated in before. This will be the third year for the SP contest. Lets all join in and see how well we can do in both contests.

Dayton is next month: We still have a few dinner tickets for the Contesters/DXers dinner on Friday night. This year's dinner is going to be really something special. We have something for everyone Contesters and DXers alike.

This month we will talk with Ray Ortgiesen WF1B of Coventry RI. Ray is 32 years old, is married to a lovely lady named Suzanne KA1JGB (whom you will have a chance to meet at Dayton this year—Ed), they have two children. Ray has been licensed since 1979, his first call was KA1CFD then KB1EM until 1990 when he got his present call WF1B. He is employed with Arnica Insurance Company for the last eleven years as a data analyst. He also has a business at home that is very important to a lot of us in the contest community worldwide. 'RTTY by WF1B,' has almost become a household word these days. (Being a log checker for CQ/DJWW I would venture to say that nine often logs sent in use it). This is why I have asked Ray to tell us all about his program from day one, up to Ver-2.25

He started contesting in the RTTY mode in 1989. When he first ran a RTTY contest, he started with Packrat software, a PK-232 and paper logging. This worked okay for the first few contests, but being a programmer he figured there had to be a better use for all that ram and cpu (640k, 4.77MHz Pc!). The first approach was to write a terminal program with lots of buffers so he didn't have to type much at all. Then he added the data entry portion. This was real interesting for if he wanted to put in a call, he would hit something like ALT-C, then type in the callsign (of course, everything stopped while he was typing). He wouldn't find out about dupes till after the contest, of course, so he would just work everyone and use his own memory for dupe checking. The output was very simple. He brought it into a SQL database, and ran lots of queries to generate the reports needed by the sponsor. It was real ugly both in use and operation.

As each contest came and went, he would add pieces to the program, to allow a little more flexibility (the only contests were CQWW & ARRL) and the only tnc was the PK-232. Remember, Ray was the only one using it, so he put in only those things he thought were important to win a contest.

After Roy Gould (KT1N) saw the pretty computer reports, they had some interesting chats about it. He's actually the person who planted the bug about "selling" it to others. Of course, Ray wasn't to keen on the idea of selling his secret weapon. He discussed this idea with a few others and they said "what the heck, if anyone's gonna make some money, it might as well be you". (Still not "making" money!!, at least not enough to quit his real job.) So he began to write the program for use by others. This is hard work! He never realized how hard it would be to come up with key-strokes that most would like (Ray liked ctrl-D to send a 'dupe-go-

away message,' but we liked alt-b to send a 'worked-before message. ' And screens and printouts—as he found beta testers they would add their personal choices, and he ended up with quite a hodgepodge of ideas. So Ray decided that he would try to be the main decision maker and use their input only for guidance. This had two benefits. He could accept all the glory, or all the blame! And on it went.. A public thanks to KT1N from Ray for the inspiration (and headaches) that have occurred!

He was operating one of the contests over at John's house when John asked if it would be a cool idea to have mouse control. Ray didn't think much of the idea at the time. (He was a DOS kind of guy, and John had used Mac's, and this was before Windows became a big hit for PC folks). Ray didn't even own a mouse. He added mouse control, and it made the program play like an arcade game. Move the mouse around and follow the data tidbits, pointing and clicking. So a public thanks goes to KING for that great idea.

The last major change to RTTY v2 is the addition of the WAEDC RTTY contest. Demand for this contest has varied quite a bit. The guys on the left coast didn't care if he left it out. The guys on the right coast and Europe have essentially demanded it! The other addition in progress is support for the K6STI software modem. It will require you to have RTTY by WF1B and K6STI's program. There will likely be a package deal for both. Expect this at Dayton '96.

Work has begun for the next major RTTY version (maybe it will be called 3.0 who knows? Maybe RTTY 97) Ray has "volunteered" (you know how that works) the assistance of two fellow programmers to help out. One is a ham Mike Muzzy (KO1X) the other is a friend from work Roger Charron. Ray promised them fame and glory, but that's about it! Actually, if he can, he would like to bring them to Dayton in '97 when the big rollout will occur (Ray hopes).

So what does Ray see in his crystal ball? RTTY is still a DOS program, but has many windowing features (pulldown menus, resizable windows). Networking support is in there as is Packetcluster(tm) support, XMS memory utilized (hint that 640K might not be enough to run all features). Ray says, the ball gets hazy. Beta testing during the next contest season.. Released to general public at Dayton '97.

Some final thoughts on it all. Don't sit back and wait for Ver-3 if you were considering purchasing the program now. Ver-3 will cost more, and he guarantee's that Ver-2 price + upgrade, will be cheaper than Ver-3 price. This will be the FIRST price increase EVER for Ray's program!

Now we will talk a little about his station and KING where he does his serious operating.

Towers and Antennas: Rays says his home station is where he plays around and gives out contacts to his friends when they need RI as a multiplier. Ray has one tower, a Rohn 25G @ 82 ft., one 80m sloper at 70 ft. aimed at Europe, one 40m two-element beam at 82 ft., another 40m two-element (fixed West), plus a 1/4 wave sloper. For 20/15/10m a TH7DX @ 77 ft, and a TH6DXX @ 37 (fixed on Europe). His tribanders are phased with a WX0B stackmatch box.

Pretty nice station just to play around with isn't it! Ray also uses

John Olson KING's station when he wants to get real serious. This station has three towers: 80—dipoles(lots), 1/4 sloper; 40—2 over 2 over 2; 30—4 over 4 over 4; 15—4 over 4 over 4; 10—4 over 4 over 4.

Ray says when John KING orders something he get three of everything.

Radio's & Amplifiers: At home Ray has a Kenwood TS-850S, a LK-450NT (No Tune) Amplifier. He uses a JPS NIR-10 with RTTY eproms. Ray uses a Kenwood SM-220 scope for tuning. Ray says operating without a scope is like going to work without your shoes.

Computers & tnc's: Rays main contest computer is a 386/40(8m RAM)and it has all the tnc's hooked up to it. He has several—Hal P38, Hal PCI-3000, AEA Pk-232, KAM, MFJ-1278, Heath HD-3030. He can run any two at one time, or more if he gets more y-adapters! Running two different models is a good way to copy crappy signals. Sometimes one will print when the other will not. He uses the Hal P38 now as his main tnc. When he takes one to KING he also brings the PCI-3000 since the tuning indicator (SPT-2) is small and portable an has easy access to run a scope. Ray always uses his NIR-10 filter with any terminal unit, the filter's can only add to the unit's capability (even the real good ones).

Favorite contest: Ray being on East Coast his favorite is naturally CQWW RTTY because of the larger amount of action and the massive amount of multipliers. With Europe just across the pond it's a turkey shoot from Rhode Island. He also likes Roundup because of the action and says he wants to beat some guy down in Texas in '96, from KING. He is also very fond of the new RTTY WPX contest. Ray came down here and operated at W5KFT's ranch here in Texas. (Note: I told Ray if he came to Texas for WPX we would go to W5KFT's ranch an do the contest. I believe Ray wanted to do WPX form here to be sure, but I think he really wanted to see what the state of Rhode Island might like with just two houses on it. Hi) He also loves the TARA sprint, you just get on for 4 hours, have a blast, and it doesn't really impact the family life at all.

Tips, Tricks & Techniques: Here is a little secret he uses in Windows or OS/2. Run two instances of RTTY accessing a different file in each (CQWW1 & CQWW2).. Run them in two windows stacked over/under or left/right (make it match your radios for easier brainwork!). Or, if you don't have two radios, but want to use packet (be sure you submit in the correct category), open a plain old terminal program in the other window. This lets you run packet and RTTY at the same time. The other thing he likes to do, is run a grayline program in a very small window (maybe a 1" x 2" window).

Favorite Bands: Ray likes 40 RTTY a lot. But there are really big headaches as there is no official 40m RTTY band. For example, if you operate what the US considers 40m RTTY (7080-7090) you will get the DX SSBers all QRM-ing you (because in their country you are in their ssb band!). On the other hand, lots of DX use the lower portion for RTTY (7025-7045) and when we operate there, we get the US cw guys QRM-ing us. (The FCC says its OK to operate RTTY there) but they will QRM you anyway. Ray enjoys the challenge of the band! Also, from New England, Europe opens up pretty early. It is easy to work the loud Europeans as early as 3pm local (2000-2100z). Ray tries to find JA's way down in the band (He does listen there! So JA's, please call CQ!) Be prepared for lots of cw QRM if you operate lower than 7030.

Contesting Preference: Ray like to CQ, but it really depends on the time of day, and whether or not the East Coast has the band conditions to support good running. In Ray's opinion, it seems there are times when it is better to just S&P all the bands quickly, then try running again.

Here are a few of Ray's contesting accomplishments:

ARRL's Roundup:
5th S/Op '90
2nd S/Op '91
1st M/S '92 @ KING
2rid M/S '93 @ K1IU
2nd M/S '95 @ K1IU
3rd S/Op '96 @ KING

CQ/DJWW Contest
4th NA S/Op '90
2nd NA M/S '92 @ KING
7th S/Op '93 @ KING
1st M/M '94 @ KING
SARTG Contest
1st S/B 40M '94 @ KING

Ray is in most contests, checking his software and trying to improve it for another version. RTTY by WF1B is a second job, but requires a lot of his time.

Ray's final statement was for his wife and kids: I'd like to think my family, Suzanne, Kristen and Ray, for the patience they have shown while I spent hours at the computer, the telephone calls that have interrupted dinner, and the many trips to the post office. I couldn't have written RTTY by WF1B without their support..

I too would like to think Ray and his family for making this article possible. Thanks a bunch old buddy..

Next Month:

We will visit with Frank Acklin HB9NL, HB0/HB9NL in Buero, Switzerland.

The next three contests:

Contest	Dates	Start Time	End Time	Operating Time
ARI	Apr 03-04	2000 UTC Sat	2000 UTC Sun	No off times
VOLTA	May 11-12	1200 UTC Sat	1200 UTC Sun	No offtimes
ANARTS	Jun 08-09	0000 UTC Sat	2400 UTC Sun	30 of 48 hrs

The VK's ANARTS contest is a true DX contest. Like Volta, it uses the exchange points table to score QSO's. ANARTS is one of the Grand Father Classics in RTTY Contesting.

Until next time, 73's de Ron AB5KD

"Remember"

*Big antennas high in the sky work better
than little ones close to the ground.*

Digital Journal Dinner

(Sponsored by IDRA)

Dayton Hamvention
Saturday May 18, 1996
Regency Ballroom - Radisson Inn

Order tickets now for this dinner. This is the premiere dinner of the digital gang. Don't miss it. Ticket information and menu as follows:

Menu

Salad Bar
Chicken Marsala
Roast Beef au jus
Whipped Potatoes
Peas & Carrots
Bread, butter
Beverage
Dessert Table

Ticket Info

Wayne Matloch, WA6VZI
Rte 2 Box 102
Cibola, AZ 85328
Tel: (205) 857-1004

Make checks payable for
\$23.00 per dinner to Wayne.
Sorry no credit cards.

No-host bar 6:00 to 7:00 PM
Dinner served at 7:00 PM

The Circus Is Coming

by Dale Sinner, W6IWO

1904 Carolton Lane • Fallbrook, CA 92028

Tel/Fax: 619-723-3838 / CIS: 73074,435



I'll bet everyone of you has been to a circus and least once in your life. And I'll also bet you had a good time. Whether it be a one or three ring circus makes little difference when it comes to have fun at a circus. This year's Dayton Hamvention is shaping up to be just like a circus. Maybe it won't have clowns, acrobats, or elephants, but you're guaranteed a good time with loads of fund things lined up for you to do. Last month I gave you a couple of hints just to whet your appetite but this month I'm going to get real serious. If you haven't made up your mind yet, maybe these tidbits will be the clincher.

In ring number one (Saturday Digital Forum) we have two excellent speakers for your entertainment. Our first speaker will be Doug Hall KF4KL (see December 1995 and March 1996 issues). Doug will be twirling his magic wand and telling us about *dsp*. If you have doubts about how this great development works then you won't want to miss this presentation. Doug will spin his magic and take the mystery out of *dsp* for all of us. Following Doug will be none other than the master himself, Bill Henry K9GWT. Bill takes us on his magic blanket through demodulator history. We'll take this fantastic trip starting with the tube era and ending with *dsp*. No one is more qualified than Bill for this journey. Whether you are a neophyte or an old pro, Bill's magic will keep you spellbound.

Friday night the DX and Contest crowd gather at the Radisson. See Ron's "The Contest Chair" column for details. Saturday night brings the Digital Journal dinner. Here you will be entertained by some seasoned veterans of digital radio. As mentioned last month Glenn Vinson W6OTC will be the featured speaker. He may not have a magic blanket but he sure gets around, as you will hear Saturday night. Our own Paul Richter W4ZB may not walk a tight rope but he surely will prove to us why we need the IDRA. Again, I'll be the ringmaster of ceremonies. No dog tricks or elephants will be performing, just the

IDRA gang having another great evening (but look out for unscheduled shenanigans!). Don't miss this affair. See the ad for ticket details.

After dinner both nights . . . what could be finer than the IDRA hospitality suite. You'll have a chance to chat with digital folks from all around the globe. Meet old friends, make new ones, it all happens here. Come join in the fun. The room stays open so long as you can stay awake, and some of our group are pretty good at that! The Guinness record for the longest eyeball QSO was set in this room.

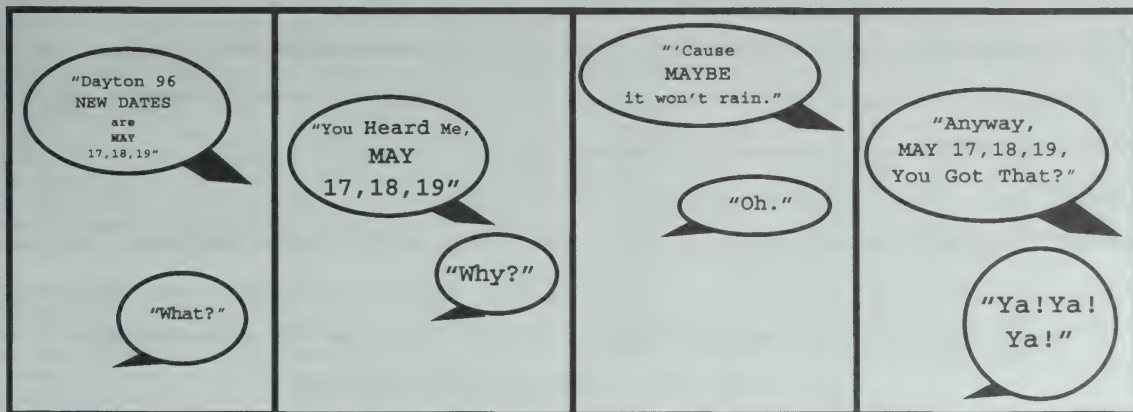
I guess I've mentioned once or twice that I've been to a number of Dayton meetings. Even though it is a lot of work for me, I still find time to have some fun, visit the flea market and chat with many digital hams. If I can do all this, I'm sure you can imagine how much more fun you'll have without these restrictions.

Making up your mind to go is the first big step. The rest is easy. IDRA makes all the arrangements except your travel to and from Dayton. Rooms are available, forums are scheduled, dinners are arranged, transportation to and from the Hara arena is taken care of by DARC, technical forums at the hotel are on the agenda . . . and the hospitality suite opens Friday night after dinner. Whether you are a DXer, Contester or a plain vanilla Keyboarder, you will find many of your type present at the Radisson. You'll also have a chance to meet with IDRA Board members so that you can give them your ideas and criticisms.

Make that room reservation today, while there are still rooms available. Call me. FAX me. CompuServe me today. Don't let the weight of waiting hold you back any longer. Here are the numbers: Tel/FAX 619 723 3838, CIS 73074,435. I'll be standing by.

73, Dale W6IWO

1996 DAYTON HAMVENTION



Survey of Readers of the Digital Journal

The first ever examination of the talents and capabilities of IDRA members and Journal readers

Please test your memory, complete the questionnaire and send this page (or a copy) to Jim Mortensen, N2HOS, P.O. Box 328, Indian Rocks Beach, FL 34635. The final results will appear in the May issue of the Digital Journal.

Indicate the year during which you a) made your first VHF/UHF digital contact _____ b) your first HF digital contact _____?

Tell us the mode used during your a) first VHF/UHF digital contact _____ b) your first HF digital contact _____?

If you utilize more than one mode at HF, a) during what year did you begin the second mode _____ and b) what mode was it _____?

If you utilize VHF/UHF digital today, a) what mode do you currently use _____, and b) for what primary purpose _____?

Tell us a) how many modes you have used on VHF/UHF _____ and b) list them _____?

Tell us a) how many modes you have used at HF _____?

Did it include RTTY _____? ASCII _____? AMTOR _____? PACTOR _____? PACTOR II _____? G-TOR _____? CLOVER _____?

What is your 'primary' or favorite HF mode today _____? What share of your on-air time does this mode command (in percent of all time on the air) _____? What is the 'secondary' mode _____? And what share of time does it occupy _____?

What is your single most important interest on the HF bands: DX _____? Contesting _____? Random contacts and chatting _____? Scheduled contacts with family or friends _____? BBS activity (either operation or utilization of BBS) _____? Other _____?

If you are interested in DX, what is your confirmed country count _____?

How many contests did you enter last year _____?

What is your favorite contest _____? Why _____?

What antenna system do you use: beam _____? Wire _____? Vertical _____? Other _____?

When did you buy your first computer _____? And what type was it _____?

What kind of computer do you use now _____? How large a hard drive _____? And, how many megs of RAM _____?

What operating system do you use _____?

What kinds of software do you use for your digital activities _____?

Have you ever a) been interested in satellite digital activity _____? Or, have you been active in this field _____?

Have you run a digital BBS _____? If so, what kind _____? Do you still run the BBS _____?

When were you first licensed _____?

Your callsign _____?

Please rate the Digital Journal (10 = perfect, 1=blah) _____? What is your favorite feature(s) of the Digital Journal _____?

Thanks a lot for participating in this the very first look at the IDRA membership.

Look for the full report in the May 1996 issue.

What's All This DSP Stuff About Anyway?

Part 3

by Doug Hall, KF4KL

4400 Duraleigh Road • Raleigh, NC 27612

You'll recall from previous months that a dsp system consists of three main components, 1) an analog-to-digital (A/D) converter, 2) a central processing unit (cPu), and 3) a digital-to-analog (D/A) converter. Last month I focused on the A/D converter, the part which converts "real-world" analog signals into digital values (numbers) which are passed on to the CPU for processing. This month I'll look at the final two parts of the dsp system, the CPU and the D/A converter.

Central Processing Unit (CPU)

Now that we've sampled the analog input signal with our A/D converter what do we do with this sequence of numbers (the digital data) that the A/D converter has produced.? That's where the CPU comes in. The main purpose of the CPU is to process the data it gets from the A/D converter. Software running on the CPU takes the digital data and manipulates it to produce the desired result. The "desired result" may be anything from simple filtering to very complex speech recognition, but the concept is the same - the CPU is simply a computer processing data. In some systems the CPU may be fairly simple, perhaps even an 8-bit microprocessor, while other systems may use the resources of a very large and fast CPU for complex signal processing tasks. But while digital signal processing may be performed by any CPU capable of reading the digital data and performing calculations, most of the time when we talk about a "dsp" we're referring to a family of specialized processors which have been optimized to perform certain math operations very quickly. Such CPUs (also often referred to as DsPs) generally offer the ability to perform an operation (such as addition or multiplication) in a single cycle of the CPU's clock. So a DSP with a 10 MHz clock might be able to multiply two numbers in 100 nanoseconds, the period of one 10 MHz clock cycle. Compare this with non-optimized CPUs which might take as many as 25 to 75 clock cycles to multiply two numbers, and you'll see why a dedicated DSP chip can often outperform other CPUs operating at higher clock rates. Because the clock speed can have little relevance when comparing different CPUs, manufacturers and users often rate a CPU's performance in "MIPS" or millions of instructions per second. The CPU described above would provide a performance level of 10 MIPS.

If the CPU in a dsp system can process the data as fast as it comes in from the A/D then we say that the system operates in "real time." Not all dsp systems are real time systems. For example, the computers which process the digital video signals from some satellites often spend many minutes or even hours processing the images to improve the sharpness or remove interference. In non-real time systems, the data is first acquired and stored, and then processing takes place. But most amateur radio dsp applications operate in real time. When you're trying to filter out QRM during a contest or decode weak RTTY signals you want the processed data immediately. Only a real time dsp system can provide this type of performance.

Dedicated DSP chips are available from a variety of vendors, including Texas Instruments, Analog Devices, and Motorola. The cost varies depending on the features and speed, but a DSP capable of 20 MIPS can be purchased for a little over \$10. As performance climbs, so does the price, with high-end DSP chips providing performance levels hundreds of MIPS and costing hundreds of dollars.

D/A Converter

The D/A converter can be thought of as an A/D converter working in reverse. Usually packaged in an IC, the D/A converter takes a digital value from the CPU and outputs an analog voltage corresponding to this value. This analog voltage is then sent to an audio amplifier or some other circuit which makes the processed signal available to the user. As with A/D converters, the resolution of a D/A converter is determined by the number of digital input lines. Most of the time the D/A converter in a dsp system will have the same number of bits as the A/D converter. Also, some ICs are available which contain both an A/D and a D/A converter in one package.

Once we have a complete dsp system with an A/D, CPU, and a D/A we can bring the system to life by adding the right software to perform the desired signal processing functions. In the amateur radio world a number of products have been introduced which make very good use of dsp. Next time I'll discuss some of these applications and give some examples of products available in the amateur radio market today which make good use of dsp.

-- 73, Doug Hall, KF4KL

1996 IDRA WW WPX RTTY CONTEST HIGH CLAIMED SCORES

by: WA4ZXA

CALL	HRS	SCORE	Q'S	PTS	MULTI
SOP/HP/AB					
KE3Q (KF3P)		717,760	832	2243	320
SM3KOR	26	585,296	640	1864	314
W2UP		561,388	705	1916	293
S59A		465,000	346	1607	290
N2RH		416,161	592	1481	281
N02T		397,574	659	1451	274
VE7IN		377,300	563	1540	245
W7LZP	30	314,925	683	1235	255
WA7FOE		312,997	674	1247	251
OH2LU		308,220	484	1401	220
SM5FUG	17	288,971	411	1273	227
S56A		287,000	415	1311	219
WG9B		275,520	488	1120	246
OI2GI		269,019	426	1263	213
N6GG		265,650	558	1190	231
IK0HBN		242,580	335	1244	195
WA0ACI		238,053	580	1087	219
WB0BLR		210,613	466	953	221
AI7B	18	205,000	575		
K0RC	25	164,920	420	868	190
K2WK		137,802	300	714	193
ZS6BRH		134,972	249	823	164
KD6TO		77,380	302	53	143
N0LEF		59,940	267	444	135

(Cont'd next page)

K0BX		47,212	156	407	116
W6OTC		37,422	153	378	99
ND8L	12	34,068	155	334	102
KF4BU		17,017	100	221	77

SOP/LP/AB

AA5AU		435,656	742	1534	284
KA4RRU		360,096	589	1364	264
N1RCT	30	340,780	580	1280	266
K2NJ	27	306,720	506	1177	260
V31JU		306,527	507	1387	221
KN6DV		244,230	525	1163	210
N9CKC		217,425	476	975	223
K4GMH		173,900	403	925	188
WA6VZI		150,535	440	805	187
WA4ZXA	28	147,312	346	792	186
A92GD		146,560	291	916	160
WA4JQS		137,370	309	726	190
VE6KRR		129,300	323	862	150
KF2OG		89,517	266	563	159
WY6/G0AZT		79,920	302	540	148
JE2UFF		63,837	168	519	123
N7UJJ		49,731	242	411	121
KC7MJ	16	44,308	221	418	106
K9RRB		40,680	180	360	113
N5MTS		29,939	177	329	91
AA6TY	26	22,440	154	264	85
N2HOS		21,736	114	247	88
VE3XAG		12,375	70	225	55
KQ4QM/WN8		100	5	20	5

Single Band

80M					
WU3V/5		137,016	301	792	173
K1IU		133,128	266	774	172

20M					
I2EOW		465,290	546	1445	322
S55T (S5500)		275,476	423	1129	244
4X6UO		265,421	403	1201	221
VE6JY		263,526	452	1002	263
N4SR		225,616	412	844	239
CF7OR		137,750	327	725	190
JR2BNF/1		28,858	109	307	94

15M					
K8OSF		714	22	34	21

MULTI/OP

AB5KD (AB5KD,WF1B, @ W5KFT)					
		824,636	1051	2278	362
RK9CWA (UA9CGA,UA9CR,RA9DK,RW9CF)					
		703,768	660	2626	268
AF4Z		378,378	668	1386	273
VE3FJB		333,889	454	1433	233
N1JIT		105,230	274	619	170
AE0Q LP (AE0Q,KI7RW)		78,638	315	574	137

RITTY

An Update

by Glenn Vinson, W6OTC

#2 Embarcadero Center, #1660 • San Francisco, CA 94111

Since I described in the February issue of the Journal a new HF software modem, RITTY, created by Brian Beezley, K6STI, two important developments have occurred: first, Ray, WF1B, added support for this modem to his RITTY contesting program; and second, Brian added FSK keying to RITTY. I tested both of these features during my few hours of operation in the ADRS WPX Contest and the results were excellent.

The versions I tested were v. 1.13 of RITTY and v. 2.25a of RTTY by WF1B. With this combination, RITTY is first loaded into high memory (taking up to 37kb, if available) with RTTY then loaded low. K6STI is selected from the RTTY modem list and loads immediately. The result is a serious, fully integrated software contest modem and logging package which, for me at least, worked flawlessly. Though Ray's text-based software cannot duplicate RITTY's native tuning and signal displays, Brian and Ray have devised a good tuning bar for RTTY that displays the desired mark and space interval, together with the relative spectral position of the received mark and space. To tune a signal, simply rotate your tuning dial until the mark and space red signal bars are within the marker blocks; when the bars turn white, print occurs. The mark and space interval may be changed as desired (Brian recommends transmitting at 182 hz rather than 170 hz to accommodate the receiving limitations of multimode controllers), and the tuning blocks will be adjusted accordingly. Also, the center frequency of the tuning bar can be adjusted to match the actual center frequency of the narrow filter passband of your own receiver. One other good suggestion is to enable transmission of redundant codes (CR, LTRS and FIGS will be sent twice). While this feature slightly slows contest exchanges, it helps the station copying you decode numbers when signals are weak or the band is noisy.

Default parameters for RITTY can be changed or adjusted by first running RITTY in low memory, making the desired adjustments, quitting the program and then loading it high. Once RITTY is loaded high RTTY by WF1B is in control and provides very limited access to RITTY's settings. However, all of RTTY's own features appear to function properly.

To run *fsk* with RITTY, you must construct a simple *fsk* keying interface (level converter) between a serial port and your radio. Brian describes generally such a circuit in his revised manual, but leaves the user to decide exactly what is needed for his own installation. Below is the schematic of the circuit that I used. This circuit was designed by Steve Stark, KE6FV, and was built by him on a small piece of perforated circuit board approximately 1 1/2 inches square, with a DB25 cable on one side for a COM port and a DIN 8-pin cable on the other side for the ACC1 outlet on my ICOM radio. For my test, I selected COM4 from the RITTY transmit menu (it supports COM1 through COM4), typed CQ and started transmitting *fsk*. No problems; no adjustments; no surprises. Now I could use the narrow filters in my receiver, enabling me to pull in the weaker signals much better than on *lsb afsk* using a wide filter.

An additional feature that may be added to a future version of RITTY is diversity reception. This option would allow those of you with dual-receive transceivers and two HF antennas to input a separate signal to each stereo channel of the SoundBlaster card, producing improved copy during selective fading.

Several other stations used the RITTY/RTTY combination in the WPX Contest, and one, Dick, N1RCT, has already reported his favorable experiences on the Internet RTTY Reflector. For a total price of about \$100¹ (plus a SoundBlaster 16 card), this combination is difficult to equal, let alone beat.

¹ Add \$5 for overseas shipping. Order direct from Brian Beezley K6STI.



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DSP vs. IF FILTERS

Which Is Better?

By Bob Lewis, AA4PB

P.O. Box 522 • Garrisonville, VA 22463-0522

During a Pactor QSO the other day I mentioned that I was using true *fsk* with my IC761 so that I could use the receiver's narrow filters on the digital modes. The other operator commented that he had decided to invest in one of the *dsp* boxes instead of buying optional IF filters for his rig. He felt that the *dsp* box would outperform the analog IF filters.

While a *dsp* filter can certainly outperform an analog filter, the overall performance of either has a great deal to do with where the filter is inserted in the receive signal chain. Those *dsp* boxes that are inserted in the audio line between the receiver and the speaker or multimode controller can work well as long as the interfering signal is not stronger than the desired signal. The problem with these add-on *dsp* filters is that they are located outside the receiver AGC (Automatic Gain Control) loop so the high gain IF stages are still subjected to the interfering signal. If this signal is strong then the receiver AGC will reduce the gain of the receiver to protect these stages from overload. The desired signal will also be reduced. If it is weak enough it will disappear into the noise. No filter in the audio stages can overcome this problem. The only solution is a filter in the IF which can reduce the level of the interfering signal *before* it gets to the high gain stages of the receiver and affect the AGC.

As the speed of *dsp* chips increase and the cost comes down, you will undoubtedly begin to see transceiver manufacturers include internal *dsp* filters at the IF level. This is where the filtering needs to be done. The problem, given the current "state of the art", is that processing a 455 KHz IF signal requires an extremely high speed *dsp* chip. The Kenwood TS-870S is probably the first entry into the amateur market with *dsp* in the IF stages. I notice that it has a fourth IF stage at 11.3 KHz. I assume that the reason for this lower than usual IF frequency is to *permit* the use of reasonably priced *dsp* chips which will function at 1.3 KHz. The *dsp* is being done inside the AGC loop so, assuming that the distribution of gain is correct, this should represent a real breakthrough in *dsp* technology.

For those who don't have a TS-870S I would suggest investing in the optional IF filters first, then follow that with a *dsp* box if you want additional filtering. Most transceivers require you to use *fsk* (not *afsk*) in order to utilize the IF filters in the digital modes. Remember that Clover and Pactor 11 are not *fsk* modes. These are multi-tone signals so you must connect them into the transceiver audio.

One final word on filtering. I have read several product reviews where the writer exclaimed that his fantastic new multi-mode box was able to copy RTTY signals that were barely perceptible by ear. If you stop to think about this a minute you will realize that any multi-mode worth it's salt should do this. What you hear coming from the speaker is (assuming *ssb* filters) 3 KHz worth of noise with a 500 Hz wide signal; a very poor signal to noise ratio. The first place this signal goes upon entering the multimode controller is generally to a narrow filter which strips off most of the noise leaving a much improved signal to noise ratio. If you were able to listen to the signal after this filter you would find that it is not nearly as weak as you thought, CW operators often experience this effect. With wide filters the signal is down in the noise. Select a narrow filter and the signal appears to jump out at you.

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Winpack: Roger Barker G3IDE built a better mousetrap. Winpack is a win3.1 or Win95 packet terminal program that has full support for mail reading, and writing, bulletin listing/reading/replying, compressed forwarding, auto-connection, script files, etc. Because it runs in Windows, your packet system can be running all the time and you can continue to use your PC for other programs. Roger has made a great contribution to the cause!

DXCC Excel Template: Don AA5AU developed this so he could display the results of the "most wanted" DX survey for his column. When you open it up in Excel 5.0+, it may seem like an ordinary worksheet, and it is... with all the potential of a live database. Add columns, rows, notes, resort or whatever, just as you would with any spreadsheet. Set it up to monitor QSL info, your own "most wanted", your 5B DXCC, your trip to the Honor Roll, and it is your own complete record of what you have accomplished or wish to accomplish. Get this one.

Express 3.5 upgrade: This single disk is designed for only those who have and Express 3.0! license. This upgrades the program to the January 1996 3.5 level. A further disk will be available in March 1996, which will add the Help file and new compression devices as well as fix a few bugs. Read Neal ON9CNC's article in the April 1996 Journal for full information on what you get with this upgrade. Remember, you must have a 3.0t on your system to qualify for the use of this upgrade.

Lan-Link: Joe Kasser's classy shareware product. This is probably the most popular of all the multi-mode terminal products. It can run everything but Clover and Pactor II, has extensive logging facilities, every conceivable Packet function. Some claim the learning curve is a bit steep in the beginning. Almost everyone says it is worth learning! The program is never out of date, so feel free to give it a try. Be sure to register if you are going to use the program regularly. You will benefit.

Winlink: Hans Kessler has taken over the earlier work of the original author and recently released a major upgrade. This is the world's standard BBS software for HF and is now in use in more countries than you can count. When coupled with scanning software (see below) the program is a multi-mode powerhouse. One nice thing about it—it isn't difficult to find help when it comes time to set this program up. Just contact almost any BBS operator and you will have reached an experienced user.

Scan: Originally designed by Peter TY1PS, Scan is a software scanning solution. In order to use the program you need an RS232 interface between your transceiver and computer. Scan is designed for the BBS operator who scans several frequencies on a continuing basis in order to pick up incoming traffic. Freeware.

WORLI: Another universal answer to the HF BBS challenge, Hank has developed a somewhat more specialized system. The WORLI BBS network is very active on the bands and easy to find and copy. This very sophisticated software is a good choice if you wish to join the activities of that group. Freeware.

HYLOG: This complete logging program supports Buckmaster CD ROMS. This is version 3.04 of a long popular system. Freeware.

(Order information on next page)



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The Last Word

from the Editor

Jim Mortensen, N2HOS • PO Box 328 • Indian Rocks Beach, FL 34635

CompuServe ID: 71573,1077



The IDRA received a gift today. Unisys Corporation of Blue Bell, PA owns the Welch patent and is entitled to royalties for its use. This is some importance to us because Express will now make use of GIF and TIFF-LZW compression and decompression methods covered by the patent. Unisys graciously allowed IDRA to use the patent royalty-free. We are all most appreciative of their generosity and have assured them we will use these rights in a most responsible way. Use of Express is absolutely limited to not-for-profit amateur radio under the terms of this agreement.

The IDRA cannot license Express 3.5 for use other than by licensed amateurs on authorized amateur bands. This rules out **any** commercial use of any kind, but also military use of any kind, including MARS. Please do not request licensing for any callsign except a regular amateur format. If that changes for reasons of upgrade, relocation or so on, new disks are available for \$10 post-paid anywhere. Please return your original disks. If you are aware of any violation of either the letter or the spirit of this limitation, please let IDRA know about it.

I am greedy and want more . . . surveys, that is. They are still dribbling in, but not enough of them. So we are running the questionnaire one more time. If you haven't sent it in, please do so now. Help us build a valid snapshot of IDRA members, their likes and dislikes, their history and their equipment. Based on the information to date, we do have a story to tell! Rip out that page or photocopy it now, and start writing. Remember to send it to me at PO Box 328, Indian Rocks Beach, FL 34635. Thanks.

Oh, the world keeps speeding up! I mentioned Quarterdeck's Webtalk program last month, if you will recall. Yes, we did try it. Yes, Peter TY1PS downloaded a copy of the software and we had a 30-something minute conversation one day. Voice quality, once we finished tinkering, was remarkable; mechanical quality something less. It works but there are bugs and the software needs some refining as does the quality of the network. But make no mistake about it, this is a development of major importance and will lead to fundamental change in our attitudes toward communication.

Having learned a little bit about that software, I was not surprised when Peter sent me a note and said he had found a better mouse-trap. And it's free! The program is SPEAKFRE and is a notch up from the Webtalk product. It is available in many locations on the Internet as "SPEAKFB.ZIP." Look for it, download it and give it a try. I don't have enough experience to comment yet.

Until yesterday I thought I could forget about that subject for a spell. Then I stumbled on something entirely new *and* free and from Intel. Now it is group chat. Here is the E-mail announcement that came through:

Name: **Internet Party Line**
Version: 1.0 Beta
File Date: 02/25/96
Size: 283 Kb
Download Time: Approx. 4 minutes with 14.4 modem
Developed By: Intel Corp. Registration:
Free Beta Evaluation
File Location: <http://www.intel.com/iaweb/aplets/iparty.exe>
Windows95.com: Category — N/A
Description:

***** PLEASE NOTE: I check all of the addresses in the digest just before mailing it out to you. The download location for Internet Party Line is not responding at the moment. Instead of removing it from this week's issue (it's too good to pass it by), keep trying, or check the Web page for this app at <http://www.intel.com/iaweb/aplets/iparty.exe>.

Internet Party Line is an extremely innovative new application from the makers of the Pentium chip. It's a multi-party audio chat program designed to work over relatively low-bandwidth connections such as the Internet. It's something like using an IRC (Internet Relay Chat) style of conversation with audio replacing text! Instead of trying to mix audio from each participant in real-time (what a mess that would be), Internet Party Line queues statements and plays them one at a time. This way, a group of people can audio chat without taking turns speaking. The program is actually implemented by two applications: IPARTY.EXE (the client) and IPARTYD.EXE (the server). You can run just the client, or choose to host Internet Party Line sessions by running the server as well. It's a little difficult adjusting to the fact that you can talk into your microphone while someone else is speaking. When you push the Talk Button, playback through your speakers stops until you release that button, at which time playback resumes where it left off, so you won't miss anything. And because Internet Party Line sessions are named by URLs (Universal Resource Locators), you can advertise your hosted sessions via your own Web page. Pretty cool stuff!"

Well, no, I haven't downloaded it. But I must say it sounds like fun. And it must be a decent piece of work if Intel chooses to put it out under its own name. It is free. So what am I waiting for? Just time to catch my breath, thank you.

Express 3.5 notes. The Help files are in draft form and should be back from TY very shortly. As soon as they go through final editing and compiling they will be posted on the HAL BBS, the IDRA FTP server and be available in the Disk Library. Help will be distributed along with a patch for Express that will include the newly available compression techniques and a few minor bug fixes. Look for that about the time you receive this issue of the Digital Journal. Check the Editor's Page <<http://home.earthlink.net/~n2hos>> for news.

HAL news. New PCC files have been released and are available from either the HAL BBS or the IDRA web site. You may also order a 3 1/2 inch floppy from the Disk Library (the files were received today). Files are available for both the P38 and PCI4000.s. The subject of the upgrade—Factor performance. The gang at HAL have been working on this code for a long time. Get the files and enjoy!

Very mini-reviews of the month. There is no way to keep up-to-date with version numbers of the latest release from Netscape, let alone review a copy. The same is true with the other browsers as well. The economic stakes are so high, and the battle between Microsoft and the rest of the world so intense that there is an eternal eruption of new products aimed at the grand prize—becoming the world standard on the Internet. Don't count on any slowing down for the foreseeable future! At any rate, after having two beta copies of Netscape expire quite unexpectedly, and after several futile attempts to buy a copy of something that I could keep on my hard disk, I made a decision. No more downloads from Netscape.com. So, when I saw that they were officially releasing v2.0, I decided to buy it and the manual so I could at least like this version of the software might take me through a year or two of turmoil. I went to their electronic store, picked out the package I wanted,



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DSP MODEM: RITTY 1.0 is a high-performance software modem that runs in your PC and uses your sound card. RITTY uses a limitless front-end, optimal matched filters, automatic threshold correction, numerical flywheel, and other advanced techniques to recover RTTY signals ordinary modems can't copy. RITTY features a graphical FFT tuning indicator that's better than a scope, demodulated-signal display, signal-timing analysis, adjustable mark/space frequencies, precision AFSK, FSK/PTT outputs, and pop-up menus. RITTY supports RTTY by WF1B, 386/40 or better, math coprocessor, Sound Blaster 16, and VGA required. \$100. Add \$5 overseas. Visa, MasterCard, Discover, U.S. check, cash, or money order. Brian Beezley, K6STI, 3532 Linda Vista Dr, San Marcos, CA 92069. (619) 599-4962. k6sti@n2.net.

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used my credit card (in guaranteed security) and the package was at the front door two days later. Navigator 2.0 for Win95 is an excellent, stable, all-around product and I heartily recommend it after some six weeks of use. There are several things to like here. First, Netscape is de facto, the Internet standard and gives the power to see every image of your stops on the Net. Second, mail has been incorporated in the program so there is no more need for a second program. The Bookmark function has been sharply upgraded and it now has the capability to build multiple directories. The pull-down menus are understandable and easy to use. "What's New," "What's Cool" and the "Internet Directory" all add to the friendliness of this interface.

The manual, after the rather odd introduction (reminiscent of Microsoft's Bob) of twenty some pages, delivers the goods. It is packed with up-to-date information and it is easily accessed. Overall it is better than most manuals. Don't hesitate to 'freeze' on this version of Netscape. Oh, yes, I know that version 3.x and 4.y are available for downloading but the improvements are, at best, marginal. I like 2.0 and am going to stay with it until there is a significant change.

PaintShop Pro. This is a plug for a piece of shareware. After using the trial software for some months, I finally decided to lay out the \$70 and get the full program. What a buy! PSP is as fully featured as the \$3-600 varieties with those famous names. Nothing else is needed, not even for serious graphic work (which I don't do, nor do I plan on it). Full image manipulation, Twain compliant, and incredible array of paint tools, and so on. Get it and you'll be glad you did.

Windows NT 4.0. The beta version of the long-awaited upgrade arrived last week. Surprise, it looks so much the like Win95 screen that you can't tell the difference. Oh, it still acts its own way—you need a password, it hates to add hardware of doubtful heritage, NT always strongly suggests that all Excel tables are read only (even when you have no intent of marking them that way) and so on. But that is the price of bullet proof protection. It's so bullet proof that it sometimes seems a bit extreme. Example, when I loaded it, the message said, "this hard disk should be reformatted." Well, I was going to do it anyway, so we zapped away. I then restarted the installation process. NT refused to recognize the disk it had just reformatted, and kept aborting the install routines! I had to reload Win3.1 and start over.

The look is complete Win95 down to the location of all the icons, Explorer, My Computer and Solitaire. It will do well. I think it will be for sale this summer, if you are interested.

It seemed such a simple solution. I was getting weary of the endless list of capitalized acronyms in the Digital Journal. Some pages looked like lower case had been dropped as an option. In my humble judgment, the esthetics of the magazine suffered because of it. Aha, said I, let's make up a list of all the offensive combinations of letters, circulate that to the DJ staff, get their comments and launch a new Style Manual. A few comments flowed back to me, changes were made and there I sat, quite comfortable with the new editorial standards worksheet. I thought that, having heard from Jules W2JGR, I had won the hearts and minds of the entire group. I even made the mistake of thinking that the March issue looked better without all those damned capitalized acronyms splattered over every paragraph. Then came the envelope from Crawford WA3ZKZ.

Innocently, I expected some more Beedles and probably a short note. Indeed there were a batch of new and very good ones. But there was also an unusually long text file listed at the bottom of the floppy disk. I saved it for last then opened it. Crawford's text arrived with such force it blew me out of my seat. He is a retired engineer who has very strong feelings about some things other than three cylinder antique farm tractors! Much stronger than I had imagined. And, over simple things about whether we use *db*, *Db* or *dB*; *mhz*, *Mhz* or *mHz*. The world, in my humble judgement does not divide

over issues such as this, that there is some flexibility allowed for publications such as the Digital Journal. Wrong! To quote, "There are some internationally agreed things that you have jumped all over. 'db'—NEVER, NEVER. It's dB. Small d for deci and B for Bel. 'mhz'—NO, NO, NEVER, NEVER, EVER! Same argument, m is for mega and H is for Hertz. Same with Baud, not baud. It's a must."

I immediately apologized for violating international treaties (though the US State Department could not produce any paperwork supporting such an agreement), and finally (just before he took his knee off my chest and his fingers from my throat) agreed that I would take another look, and that I would consider honoring these gentlemen inventors of old such as Bel and Hertz (I thought they rented cars!). He accepted my surrender without imposing any other harsh terms.

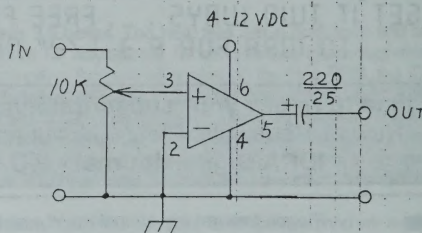
Indeed, upon carefully rereading his memo in its entirety (in the quiet of my office), I came to realize that he had a point. In fact, he had a scheme around which I could reorganize my approach to the subject. Further, I realized he didn't really disagree with my objective, he merely reacted violently to a small number of the tactics required to reach the objective. These engineers, you know, aren't very flexible (maybe that's why most of our bridges stay up most of the time).

All of which leads me to say that a) my good friend Crawford made his point b) I will take another stab at realigning ancient traditions and c) the Digital Journal might look a bit inconsistent over the next couple of months but d) in the end, we will have a new Style Manual worthy of the name. Thanks Crawford.

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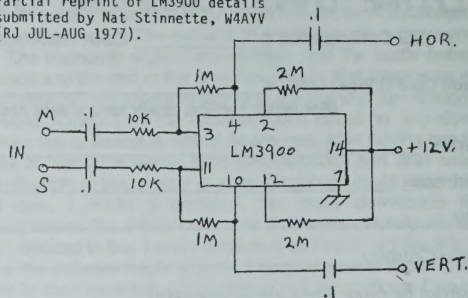
73 de Jim N2HOS sk

(Cont'd from page 13)



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New Exciting Features!

Bonus Receive Band — The 430 (440) MHz bonus band is available for receive. Enables full duplex, crossband operation between the 2 M and 70 cm bands. Crossband repeat from 440 MHz to 2 M.

Scratch Pad Memories — 10 scratch pad memories automatically store your 10 previously transmitted frequencies (5 simplex and 5 duplex) for instant recall. No fumbling around trying to write down, or store into regular memories, frequencies which you want to use temporarily.

Memory Allocation Function — 60 regular memory channels can be divided between the main and bonus band. You can organize your memories for maximum efficiency and listening preference.

Automatic Memory Channel Advance — After a memory channel is programmed, the channel indicator automatically advances, speeding up the programming process.

Tone Scan* — Scans, detects *and* sets the subaudible tone. Permits access to a repeater when you don't know the tone frequency.

* Optional UT-85 required.

Voice Synthesizer* —

The IC-281H announces the operating frequency, enabling quick confirmation without taking your eyes off the road. Very helpful for visually impaired operators, too.

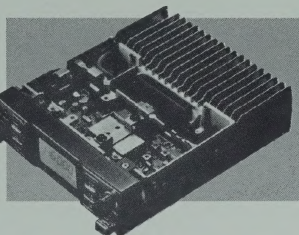
* Optional UT-66 required.

Packet "Plug and Play" Operation

Data Jack — Connects a TNC directly to the modulation circuit for packet convenience.

9600 BPS Capability — No modifications necessary. Provides higher performance packet operations.

Modulation Circuit — Newly designed, prevents over modulation even during high data throughput.



Rugged, Durable Construction

Die Cast Aluminum Frame Construction — Meets the highest standards to provide reliability and long life. Will enhance your trade-in value years later.

Large Heat Sink — Dissipates the heat to maintain power output and stability characteristics.

Simple Operation

Remote Control Microphone — Puts the operation of several functions at your fingertips.

Auto Dialing Capability — Programs 14 telephone numbers for autodial via repeater autopatch.

"One Push" Action Switches — Eliminates the need for "two step" function switch operation. Simplifies mobile operations for convenience and safety.

Large Display — Easy to see and logically organized for easy interpretation.

Auto Power Off — Shuts the transceiver down (when programmed). Great for bedside use.

Compatible Accessories — For easy mounting and operation.

And More!

- Built-in Pager and Code Squelch
- Optional Tone Squelch and Pocket Beep
- Scanning



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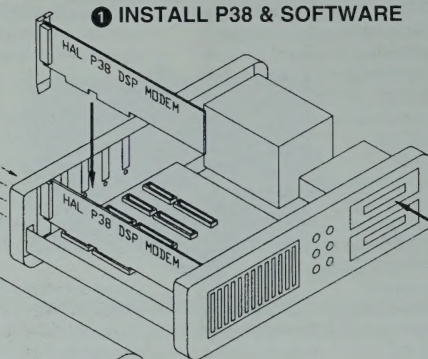
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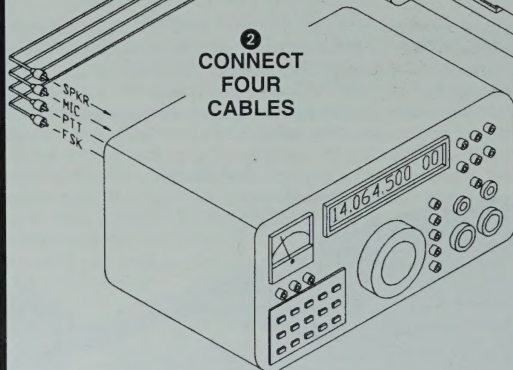
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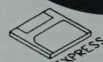
1 INSTALL P38 & SOFTWARE



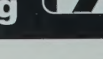
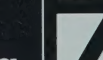
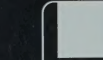
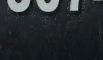
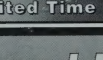
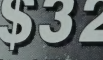
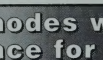
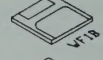
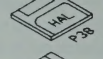
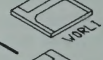
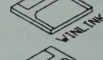
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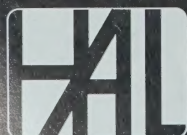
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